Air pollution and climate change: The ignored curse of rural India

By Sameer Mishra.

India's true essence — encompassing its diversity, zeal, culture, and spirit — is rooted in its rural areas. However, the gloomy blanket of air pollution conceals the very soul of our nation. We are experiencing alarming signs of the warming climate and its linkage to air pollution. Though poor air quality has largely impacted rural health and well-being, most mitigation efforts continue to focus on urban problems, ignoring rural air pollution.

Issues at large

Air pollution is the biggest environmental health risk today, causing increased disease and early deaths. It reduces the global life expectancy for humans, and also negatively affects economic output.

Roughly 64.61% of India's total population lives in rural areas. These have been neglected for a long time by scientists and policymakers alike. Although it is assumed that air pollution only affects urban areas, it is a transboundary problem that spreads across a vast airshed covering entire districts, states, and rural boundaries. In fact, rural communities are plagued by both indoor and outdoor air pollution. Moreover, despite being the backbone of our economy, the agrarian sector has become the primary cause of air pollution in rural areas.

Climate change, coupled with air pollution, has impacted normal seasonal cycles, further affecting crop production, livelihoods, and food security, forcing the adoption of non-agricultural livelihood alternatives and migration in most rural regions. The rise in emissions from burning biomass, harvesting, and the use of tractors and diesel pumps has contributed to the increase in climate-forcing pollutants, such as black carbon, methane, ozone, and sulphate aerosols. These pollutants and the increased CO2 levels absorb incoming solar radiation. Beyond their indirect effects on climate, two powerful pollutants — tropospheric ozone and black carbon — directly affect agricultural yields. In addition, since most power plants and heavy industries are located beyond cities, relocating more industries to rural areas would further deteriorate air quality.

An estimated 493 million Indians, or 36% of the overall population, rely on solid fuels, kerosene, or biomass for cooking, as they lack access to clean cooking methods. Using biomass fuel for cooking worsens indoor air quality, leading to several cardiovascular and pulmonary diseases.

The situation necessitates urgent initiatives to improve the air quality beyond our cities and build long-term climate resilience.

Sustainable development goal (SDG) target 3.9.1 calls for reducing the burden of air pollution-related illnesses and fatalities, whereas SDG target 7.1.2 aims to increase access to clean energy. Also, rural areas must reduce CO2 emissions to meet the global Paris Agreement objectives. These targets can only be achieved by providing techno-feasible and affordable alternative energy sources to rural communities. Nature-based solutions are most sustainable and rooted within agrarian communities. They can, thus, aid in better adaptation, lowering the excessive

temperature rises and reducing the ill-effects of air pollution and climate change. Further, integrated policies can make a big difference and research has identified some common sectors where unified approaches can maximise benefits.

The way forward

The National Clean Air Programme — the country's first effort to improve air quality — recommends extensive, time-bound efforts in urban and rural areas. However, there has not been much focus on air-quality monitoring or advancement beyond non-attainment cities. Recently, IIT-Kanpur has planned to strengthen the national network of low-cost air-quality sensors in rural India, which could be a milestone. Climate change mitigation efforts can help reduce air pollution, while clean air initiatives can aid in lowering greenhouse gas emissions and reducing global warming. Short-lived climate pollutants (SLCPs) like methane and black carbon emitted from livestock have a short atmospheric lifetime, and agricultural co-benefits of SLCP reduction can be significant and almost instantaneous. In addition, implementation of nature-based solutions, development of blue-green infrastructure, and wetland conservation can provide carbon sinks and reduce pollutants.

Further, to provide a consistent air quality update, a denser network of air-quality monitoring stations is required to alert farmers on extreme climate and pollution events. Stubble burning can be checked by providing farmers with affordable alternatives. Increasing awareness among women on the health implications of indoor biomass burning can help control domestic air pollution, thus improving the quality of life.

Policy integration and alignment need to accelerate India's transition to clean energy to achieve our common sustainable targets by 2030. Continued efforts are needed to identify specific polluting sources in rural areas and their primary implications, and constantly monitor the trends, with an aim to devise better geographically targeted measures. Viewing air pollution as a national crisis, consolidated efforts should seek better harmony in rural and urban sectors in order to ensure substantial impacts of pollution control measures.