Comprehensive Air Pollution Impact Estimation Can Help Deal with the 'Triple Planetary Crises'

By Krithika Ravishankar

"Healthy Air, Healthy Planet" — the theme for this year's International Day of Clean Air for Blue Skies 2021 — is upfront in acknowledging the ubiquity of air-pollution effects, calling for collective efforts to improve our air for a better tomorrow.

Estimating the success/failure of air-pollution control initiatives is an important part of the efforts towards better air quality. Globally, multiple approaches are used for estimating air pollution costs, as also for measuring the benefits of air-pollution reduction. One of the approaches is the income-based approach, which considers the loss of expected output over the lifetime of an individual due to premature mortality or morbidity as a cost of air pollution. The other is the welfare approach, which monetises air pollution costs using the value of a statistical life (VSL) — a typical term used in economic analyses, which reflects the aggregation of individuals' willingness to pay for a marginal reduction in their risk of death.

By using VSL to value the number of premature deaths avoided, the benefit of air-pollution reduction can be obtained. There are currently no robust India-specific studies for estimating VSL in the context of air pollution. As such, the VSL from developed countries is employed, after adjusting it to accommodate the differences in the perception of trade-offs (between money and risk of death) in different countries and regions.

While the welfare approach is a more comprehensive measure as it takes into consideration the other "goods" people place a value on (like leisure, consumption, and good health), besides income or productivity, it does not explicitly account for the

environmental damages that air pollution causes, thereby downplaying the actual extent of air pollution damage.

A study by Cropper et al estimated the net benefits of emissions-reduction technologies in coal-fired power plants, using VSL to value the benefits of avoided deaths due to air pollution. Since VSL looks at only mortality, the study — while calculating these net benefits — did not include the environmental benefits of air pollution reduction.

Such exclusion (in many air-pollution impact studies that employ VSL) has significant implications, particularly in the context of climate change.

The latest Intergovernmental Panel on Climate Change (IPCC) report shows that air pollution exacerbates the negative effects of climate change such as extremes of temperature and weather variability. The occurrence of 'acid rain' on vegetation and on soils, which increases their acidity, thereby affecting the flora and fauna adversely, is a clear example of how air pollution can cause biodiversity loss.

Given these powerful connections, it makes a lot of sense to include environmental aspects of air-pollution –unfavourable or favourable (when air-pollution is reduced) — to arrive at the true extent of the impact. Further, since people's vulnerability to events like droughts and intense monsoons is not universal, estimation of the effects of air pollution on the environment will allow for a better understanding of the skewed distribution of negative effects of air pollution across different segments of the population.

As a bonus, better estimates could buy political favour for climate action, as both excess emissions and air pollution are caused by much of the same sources (e.g.

biomass and fossil fuel use), and can therefore be rectified using similar policy interventions (alternative fuels, better public transport, etc).

With increasing attention to the intimate linkages between climate, nature, and pollution, and an acknowledged urgency to address the 'triple planetary crises' of climate change, biodiversity and nature loss, and pollution and waste, the estimation methods employed in air-pollution impact studies need to evolve. Solving these interlinked issues clearly requires an integrated approach. This holds true for impact estimation too!

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