

GLOBAL INFORMATION SOCIETY WATCH 2020

*Technology, the environment and
a sustainable world: Responses from
the global South*



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC)
AND SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY (SIDA)

Global Information Society Watch 2020

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INDIA

AIR POLLUTION MONITORING IN INDIA NEEDS TO BUCK UP, SCALE UP AND INTERACT WITH COMMUNITIES TO MAKE A DIFFERENCE



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Introduction

Air pollution is an acute problem in India, but one that most Indians are unaware of. Data for monitoring air pollution is inadequate, with few links made to the health impacts on different communities according to their exposure levels. The entire effort of mitigation seems to be concentrated on exiting the world's lists of most-polluted countries, where India is always at the top.

Rohit Negi argues that the issue of poor air quality is often set up as a trade-off between development and the environment because the most potent makers of toxic air are also the engines of development. Opting for development creates “hazardous futures” by “expanding economies in deeply unequal social formations.”¹ Sustainable development² might be the need of the hour, but it might never come to fruition with unequal social formations as its basis. Both those who live and work in industrial hubs of a modern city and those in the global South of the developed world suffer the most immediate consequences of this development. As Negi aptly puts it, “It has become clear to residents of Asian and African cities that modernity is not a promised land but a dystopia filled with poisonous air.”

Context

India's air pollution monitoring system is a complex maze. While there is a lot of data, it is often confusing and inaccurate, and only applies to more prominent areas and cities in the country. It is woefully inadequate for tier one and two towns and remote villages where the media glare is less pronounced. The government has launched programmes to address the issue without adequate public awareness efforts to make them successful. Initiatives such as

the National Air Monitoring Programme (NAMP) or National Clean Air Programme (NCAP) promise to reduce air pollution by 20% to 30%, but the motivation behind these promises is unclear. Prakash Javadekar, the current environment minister, recently went as far as to say that there is no link between air pollution and poor health in the country.

The Air Quality Index (AQI) is the most common measurement index for air pollution and is an indicator and a tool to assess pollution levels from a range of pollutants and their corresponding health impacts. While AQI indices are also used in India, a scarcity of monitoring stations to capture AQI for localised regions and deficiencies in real-time monitoring of pollutants render the index inadequate for effective policy making.

The World Health Organization (WHO) reported in 2019 that 11 of the 12 cities in the world with the most pollution from PM_{2.5} – particles smaller than 2.5 microns in diameter that can cause dangerous heart and breathing problems – were in India. India dismissed the study, as well as the one from a Yale University research team³ which put India on the list of the top polluters of the world, as biased.⁴ Page two of a 2019 report by the NCAP⁵ rebuffs international concerns about the health conditions in India due to air pollution. It states, “The reported perplexing statistics in various international reports, correlating air pollution with health impacts without the use of indigenous dose response functions, further complicates the issue by possibly creating an ambiguous public perception.”⁶

Negi has explained how showing a preference for indigenous air quality numbers might derail the monitoring process as a whole, because some air quality monitors are expensive even for central

1 Negi, R. (2020). Urban Air. *Comparative Studies of South Asia, Africa and the Middle East*, 40(1), 17-23. <https://doi.org/10.1215/1089201X-8185994>

2 <https://www.iisd.org/topic/sustainable-development>

3 Lakshmi, R. (2014, 17 October). India launches its own Air Quality Index. Can its numbers be trusted? *The Washington Post*. <https://www.washingtonpost.com/news/worldviews/wp/2014/10/17/india-launches-its-own-air-quality-index-can-its-numbers-be-trusted/>

4 Ibid.

5 Ministry of Environment, Forest and Climate Change. (2019). *National Clean Air Programme*. http://moef.gov.in/wp-content/uploads/2019/05/NCAP_Report.pdf

6 This quote shows the use of confusing phrases to hide real issues. For example, there is no explanation of what “indigenous dose response functions” means. Yet it is used in an official public report to quell the rising anger over the government's inaction against pollution, which is now being noticed internationally.

governments, and need international intervention for accurate observations.⁷ Additionally, national⁸ and international⁹ media have reported how India's air quality numbers could not be trusted because of the tripartite reasons of faulty equipment, data fudging and lack of concrete government regulation in the monitoring space.

Monitoring

There are two kinds of regulated air pollution monitoring systems in India, manual and real-time. Manual monitors collect air samples from the areas where they are located, which are then tested in a laboratory for the specified air pollution parameters according to National Ambient Air Quality Standards (NAAQS).¹⁰ As with any manual system, they are riddled with problems of accuracy and can only provide air pollution data with a time lag. Real-time monitors are automated and give immediate, accurate results, but are very expensive to procure and maintain.

According to a report on air pollution by the Centre for Science and Environment (CSE),¹¹ 70% of the manual monitors do not adhere to the rules laid down by the Central Pollution Control Board (CPCB) for reporting air pollution, one of which requires data from 104 days of continuous monitoring. The report says that sometimes data used is from as few as 50 days of monitoring – half of what is required.

A large percentage of the air pollution monitors are developed, tested and calibrated in the United States and Europe, where ambient conditions, the amount of dust in the air and overall air pollution are very different from that in India. Testing for dust is done with products like “Dolomite powder”, which produces dust particles of up to five or up to 10 microns. However, Indian conditions are such that dust particles of all sizes make a cocktail in the air and need to be monitored for these differences.¹² Air monitors measuring dust in India need a higher horsepower pump than those used in European

conditions. It is difficult to trust the data when the monitors have not been calibrated and certified to work in Indian conditions.¹³

The second-generation monitors are the real-time monitors which remove the need for manual intervention by using electronic methods for air pollution measurement. However, they are expensive and, again, because of a lack of India-based manufacturing (which could sufficiently bring down cost), they are not used much in India and the few that are operating are not used for legal reporting.¹⁴

A news report in 2018 claimed that the National Physical Laboratory (NPL) would start certifying instruments from September 2018.¹⁵ However, another news report in April 2019 stated that the government has decided to designate the NPL as a certifying agency and that it would be ready to certify air pollution measuring instruments in two to three years.¹⁶ There is still no considerable development in this area.

Air quality is also monitored in India using sensor-based equipment. These are the low-cost, easily accessible instruments, but they cannot be used for policy making because of a lack of standards. According to a 2016 report by the CSE, low-cost sensors need to be the future of regulatory monitoring in India.¹⁷ However, they need to meet the standards of regulatory monitoring in order to do so. A lack of guidelines¹⁸ or protocols for certifica-

7 Negi, R. (2020). Op. cit.

8 Rajshekhkar, M. (2014, 14 October). Why India's numbers on air quality can't be trusted. *Economic Times*. <https://economictimes.indiatimes.com/news/environment/pollution/why-indias-numbers-on-air-quality-cant-be-trusted/articleshow/44808434.cms>

9 The Guardian. (2014, 20 October). India's air quality figures can't be trusted. *The Guardian*. <https://www.theguardian.com/environment/india-untamed/2014/oct/20/india-air-quality-delhi-polluted-city-world>

10 https://cpb.nic.in/uploads/National_Ambient_Air_Quality_Standards.pdf

11 Roychowdhury, A., & Somvanshi, A. (2020). *Breathing Space: How to track and report air pollution under the National Clean Air Programme*. Centre for Science and Environment. <https://www.cseindia.org/breathing-space-9923>

12 Interview with an expert on air pollution monitoring equipment at the Centre For Science and Environment, New Delhi.

13 Sharma, S. (2019, 24 August). Reliable Air Quality Data Essential to End Air Pollution. *Hindustan Times*. <https://www.hindustantimes.com/cities/reliable-air-quality-data-essential-to-end-air-pollution/story-2TsDZ82RYN5QdHN2bXYINP.html>

14 Legal reporting would mean using data for official/policy-related purposes, which would require data that could stand in a court of law if challenged. Real-time monitors are not used for legal reporting, only for reporting daily AQI numbers, as mentioned in this article quoting a report from the Centre for Science and Environment, New Delhi: PTL. (2020, 11 February). Over 70% air quality monitoring stations not recording data properly: CSE report. *Outlook*. <https://www.outlookindia.com/newscroll/over-70-air-quality-monitoring-stations-not-recording-data-properly-cse-report/1731831>

15 Koshy, J. (2018, 27 June). Air pollution sensors to be certified from September. *The Hindu*. <https://www.thehindu.com/news/national/air-pollution-sensors-to-be-certified-from-september/article24264474.ece>

16 Choudhary, S. (2019, 30 April). India to develop own certification facility for air pollution monitoring equipment. *Mint*. <https://www.livemint.com/news/india/india-to-develop-own-certification-facility-for-air-pollution-monitoring-equipme-1556561927930.html>

17 Roychowdhury, A., Chattopadhyaya, V., & Shukla, S. (2016). *Reinventing Air Quality Monitoring: Potential of low cost alternative monitoring methods*. Centre for Science and Environment. https://cdn.cseindia.org/attachments/o.85392300_1505190810_reinventing-air-quality-monitoring-potential-of-low-cost-dec27.pdf

18 Singh Bisht, D. (2019, 30 August). Sensor-based air quality monitoring instruments left out of new certification scheme. *Down To Earth*. <https://www.downtoearth.org.in/blog/air/sensor-based-air-quality-monitoring-instruments-left-out-of-new-certification-scheme-66447>

tion of sensor-based equipment makes it difficult to set up standards. A news report from August 2019 stated that the NPL would also certify low-cost sensor-based monitors,¹⁹ but it is still not clear how the government would go about developing standards for such instruments.

Polash Mukerjee, an air quality expert at the National Research Development Corporation (NRDC)'s India Programme, agrees that it is difficult for sensor-based equipment to follow the standards set down for regulatory-grade monitors because of the complicated formulas they have to adhere to. However, in order to scale up and collect data for far-flung areas that are often away from the media glare, we would need to use estimated outputs from low-cost sensor-based equipment scattered all over the country rather than the few, albeit standardised ones we have right now. This could be effective. According to Mukerjee, calculating trends over the entire country should be prioritised over calculating accurate numbers of fewer areas, because air pollution does not adhere to state boundaries and needs to be addressed as a collective problem affecting the entire country. The CSE report also states that trends as reported by sensor-based monitors are accurate.²⁰

Mitigation

The programmes to reduce air pollution in India have gone under names such as NAMP, initially called the National Ambient Air Quality Network (1984-1985), the Graded Response Action Plan (GRAP, 2017)²¹ or, more recently, the NCAP (as late as 2019). They work on empirico-positivist ideas of measurement and mitigation. These do not consider the impact of pollution on communities or efforts at stakeholder consultations to ensure community buy-in to help mitigate the causes of pollution. Even when based on measurements alone, monitoring efforts are not sufficient. The NCAP reports only 703 manual operating systems placed in 307 towns/cities across India's 29 states and six union territories.²² A report by UrbanEmissions.info estimates that India needs 2,800 monitors in urban areas and 1,200 in rural areas for adequate monitoring data for the country.²³ Along with being inadequate, the NCAP report also

states that the data generated by manual monitors should be taken as indicative because of the biases and variations that creep in due to the large number of personnel and equipment used in the process.²⁴ The data quoted is itself five years old. The NCAP was also launched using the "smart cities" framework,²⁵ without any consultation with communities, when it is widely known that the smart cities project is a non-starter in India.²⁶

Through photos, Aruna Chandrasekhar and Ishan Tankha tell the story of the people most affected by air pollution in India.²⁷ These are marginalised communities who have to live every day with debilitating conditions but have to suffer the one-measurement-fits-all approach of the government.²⁸ These communities suffer from state apathy, and are invisible to the government, even in the face of living in toxic air. Workers and residents of industrial areas in cities like Delhi suffer this fate while making substantial contributions to development. In turn they are denied the right to be counted as exceptional sufferers.

One of the most vulnerable groups to suffer the health consequences of air pollution are women, especially in villages where biofuels are used for cooking and heating purposes.²⁹ Even after liquefied petroleum gas (LPG) cylinders were distributed under the Ujjawala Scheme,³⁰ the high cost of refills, along with subsidies that one can only access with the help of universal biometric identification in India (or Aadhaar)³¹ – and a general apathy to move to LPG because it is the women who have to suffer

24 Ministry of Environment, Forest and Climate Change. (2019). Op. cit. <http://smartcities.gov.in/content>

26 Roychowdhury, A. (2019, 18 September). Smart Cities Mission: Ambitious at the outset, progress slow after 4 years. *Business Standard*. https://www.business-standard.com/article/economy-policy/smart-cities-mission-ambitious-at-the-outset-non-starter-after-four-years-119091800607_1.html

27 Pundir, P., & Tankha, I. (2019, 11 June). These Photos Document the Most Polluted Cities in India (and the World). *Vice*. https://www.vice.com/en_in/article/gy4md3/these-photos-document-the-most-polluted-cities-in-india-and-the-world

28 The CPCB method of calculating the average of the readings of all real-time monitors in a city is not the most scientifically accurate, as it admits on its own website, but is used for the sake of simplicity. Please refer to the AQI Bulletin: https://cpcb.nic.in/upload/Downloads/AQI_Bulletin_20200721.pdf

29 Gupta, A. (2019). Where there is smoke: Solid fuel externalities, gender, and adult respiratory health in India. *Population and Environment*, 41, 32-51; Spears, D. (2019). *Air: Pollution, Climate Change and India's Choice Between Policy and Pretence*. Harper Collins.

30 Pradhan Mantri Ujjawala Yojana: <https://pmuy.gov.in>

31 Lahoti, R. (2016). Questioning the "Phenomenal Success" of Aadhaar-linked Direct Benefit Transfers for LPG. *Economic and Political Weekly*, 51(52). <https://www.epw.in/journal/2016/52/web-exclusives/questioning-phenomenal-success-aadhaar-linked-direct-benefit>

19 Koshy, J. (2019, 26 August). CSIR to certify air quality monitoring sensors. *The Hindu*. <https://www.thehindu.com/sci-tech/energy-and-environment/csir-to-certify-air-quality-monitoring-sensors/article29254124.ece>

20 Roychowdhury, A., Chattopadhyaya, V., & Shukla, S. (2016). Op. cit. https://cpcb.nic.in/uploads/GRAP_Notification.pdf

22 Ministry of Environment, Forest and Climate Change. (2019). Op. cit.

23 UrbanEmissions.info. (2018, 12 March). Air Pollution Monitoring 101. <https://urbanemissions.info/blog/pieces/air-monitoring-101>

the smoke – has led to a very low conversion of “chulha”-based kitchens to LPG-based ones.³²

Scholars and activists would call this an issue of “data justice” which explicitly talks about the “dehumanization of decision making and interaction around sensitive issues.”³³ For the government, the communities that endure air pollution should be treated equally to the residents of posh residential areas, who get to sit in their drawing rooms, (now) working from home, while three air purifiers clean the air they breathe.

A number of studies show how, especially in the industrial emissions system, the numbers are either wrongly reported or the monitors are placed at locations where they report less pollution.³⁴ This is also because of a lack of any guidelines from the government for installing or maintaining the monitoring systems. A businessperson from a food company I spoke to said that if their factory gets categorised as polluting, it would become next to impossible to bring it back to an operational state because of the bureaucratic procedures and requirements.

Conclusion

Air pollution monitoring and efforts towards mitigation lack focus in India. The result is a number of programmes, bureaucratic pronouncements and loads of money spent without any significant impact on people’s health and well-being. State Pollution Control Boards (SPCBs) have primarily existed to check on emissions and certify polluting industries, rather than keep the quality of ambient air in check. Even with the current focus on air pollution, data from SPCBs barely meets the CPCB guidelines. While real-time monitors give a near accurate description of air quality, they are expensive and hence not present in most cities, with Delhi hoarding most of them. Without real-time monitors, there is no way to know immediate air quality conditions because manual monitors report with a time lag (and often inaccurately). Indigenous manufacturing, calibration and certification to bring down

equipment costs and increase accuracy are still in their infancy.

A number of SPCBs do not even report their numbers to the public if they are not up to expectations, because they could cause a media hue and cry. People in areas that go unreported are excluded from government measures for pollution mitigation because the problem is conveniently hidden. Even when the numbers are correct, experts say, they are not used for mitigation purposes because of a lack of political will.³⁵

Local populations need to be taken into account in order to design custom mitigation policies for the most vulnerable to climate change and pollution. Denying the existence of human sufferers in an issue such as air pollution makes policy making a slave to numbers and statistics which are open to manipulation and fabrication. What we need is rigorous data which is trustworthy, and can be used by the government to issue timely and accurate notifications to people. Research and development in low-cost devices could go a long way in getting the scale of the problem right in terms of data, even for far-flung areas of the country. Mitigation efforts should be a collaborative exercise with the communities that are most impacted, not just a punitive, bureaucratic hurdle to pass.

Action steps

The following steps are necessary in India to improve the monitoring of air quality:

- Increase the national monitoring budget.
- Increase training and human resource development in monitoring.
- Develop robust systems for audit and maintenance, especially for regulatory-grade monitoring equipment, to reduce errors and biases.
- Make air pollution control part of health policy and measure outcomes accordingly, rather than simply relying on data that can be manipulated.
- Democratise data collection by standardising the methods for data collection. In order to get generic trends (and for quick action), we need to allow for affordable and accessible monitoring across India.
- Speed up the indigenous calibration and certification of air pollution measuring equipment.

32 Tripathi, B. (2019, 14 August). Make Cooking Gas Cheaper For Poor, Remove Subsidy For Rich: Study. *IndiaSpend*. <https://www.indiaspend.com/make-cooking-gas-cheaper-for-poor-remove-subsidy-for-rich-study>

33 Dencik, L., Hintz, A., Redden, J., & Treré, E. (2019). Exploring Data Justice: Conceptions, Applications and Directions. *Information, Communication & Society*, 22(7), 873-881. <https://doi.org/10.1080/1369118X.2019.1606268>

34 This report, for example, shows the problems that plague the installation and working of continuous emission systems and the faulty data they report: Gupta, R. (2019, 16 September). Implementation of this efficient pollution monitoring system caught in delays. *Down To Earth*. <https://www.downtoearth.org.in/news/air/implementation-of-this-efficient-pollution-monitoring-system-caught-in-delays-66746>

35 Jain, R. (2020, 9 April). Environment Law: Proposed Norms Dilute The Process Rigours, Experts Say. *Bloomberg Quint*. <https://www.bloombergquint.com/law-and-policy/environment-law-proposed-norms-dilute-the-process-rigours-experts-say>

Technology, the environment and a sustainable world: Responses from the global South

The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

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