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Prompt #3

Word Count: 1046

Prompt: Former House Speaker Tip O'Neill is famous for bringing the phrase "all politics is local" into the public consciousness. Write an article analyzing an issue important to your home community and evaluating potential solutions.

New Delhi is often lauded in the international community not only for its significance in leading the world's largest democracy but for its role as a beacon of diversity - representing a vast melting pot of cultures that extends to the whole of India through a wider lens. It is unfortunate that one prominent factor that impacts the diverse residents of this city is the plague guised as air pollution. Estimated by the Hindustan Times to be the equivalent of smoking an alarming 49 cigarettes per day, a day in Delhi (especially during winter months) puts the human body in excessive contact with dangerous particulate matter that is past anything it is meant to withstand.

According to the United Nations World Health Organization, PM2.5 is a key particle with diverse chemical components resulting primarily from combustion with an aerodynamic diameter of less than 2.5 micrograms. As per the California Air Resources Board, numerous adverse health impacts, including premature mortality, asthma attacks, and acute and chronic bronchitis, can all be associated with short-term PM2.5 exposure for infants, children, and older citizens alike.

The official guiding recommendation of an acceptable PM2.5 level is precisely five micrograms per annum. Delhi has surpassed it and broken the scale (literally), reaching unseen highs of above 250 micrograms of PM2.5, over 50 times the limit, as reported by AQI China. Undoubtedly, the threat posed by the abundance of pollutants is severe, leading to 54000

estimated premature deaths and a significant portion of a 36.8 billion USD air pollution-related healthcare cost, as the Energy Policy Institute of the University of Chicago reports.

In pursuing effective solutions to drive down air pollution, a key focus is the agriculture sector and the practice of burning crops, which harms the quality of Delhi's air when conducted in neighboring states and regions. A paper by *Xiufeng Yin et al.,* exploring transboundary air pollution on air quality in China concluded that biomass burning is the second largest source of air pollutants with adverse effects on human health, climate change, and the environment.

In India, the post-autumn period is dreaded as farmers assiduously resort to crop burning as the most effective and efficient way to dispose of farm waste and positively impact their crops with the positive nutrients generated. Since this continues well into the winter months when the air is already thick and stays close to the ground, in several of the Northern and hilly regions of the country with colder climates, crop burning is directly associated with significantly higher rates of respiratory diseases, aggravated heart and lung conditions and allergies, especially among the oldest and youngest populations.

Alarmingly, farmers in Punjab, where most of the crop burning occurs, farm residue burning has been estimated to have contributed to 66,200 air pollution-related deaths in India in 2015. Therefore, no-burning options have emerged as a critical solution to address this issue. Incorporating residue into the topsoil, often using tilling equipment and mulching, helps farmers increase soil moisture, decrease weed growth, and replenish soil nutrients.

Training and incentivizing farmers to use the right mulching equipment that helps them deal with the problem cost-effectively is paramount. Subsidizing equipment for tilling and mulching and ensuring its adequate availability, accessibility, and know-how for ease of use is recommended as a key solution to this problem in Delhi and north India. Social media mobilization for mass dissemination of knowledge and practices is also essential to the solution. Self and peer learning to enable farmers to adopt new technologies and safer practices are also critical driving factors, as determined by a study conducted by *Krishnapriya et al*.

To complement the pertinent influences of agriculture, the omnipotent transportation sector, excessively utilized in private forms, will ultimately be critical to determining future advancements in air quality throughout Delhi.

A systematic review was undertaken of various policies and solutions implemented to curb the threat of air pollution by *Jafari et al*., finding that most of the solutions adopted by Governments were rightly related to the transportation sector, on changing energy sources followed by policy changes in agriculture and industry in many cases.

Governments have typically focussed on either incentives for behavior change, supportive policies such as subsidies for alternative fuel use, or punitive actions such as levying fines and tolls for non-compliant vehicles, among others. In the capital of India, a recently adopted Graded Response Action Plan (GRAP) policy that adopted a more punitive stand for non-compliance with increasing levels of restrictions on several activities that directly impacted air pollution

levels has been hailed as 'effective' in the short term but is not a potentially sustainable solution due to the severe restrictions that negatively impact livelihood and economic activities.

Thus, long-term solutions for air pollution related to the transportation sector must focus on less private car ownership and usage, phasing out fuel engines to electric engines, significant increase and ease of access to public transport, and incentivizing healthy commute options like biking and walking where feasible.

Interestingly, one of the major offenders of reduced vehicles on the road is the online food and other goods delivery sector, which needs to be evaluated more stringently. A study conducted in Jakarta, Indonesia, by *Matsuyuki et al.*, found that the frequent short trips by motorcycles of food delivery vendors and others resulted in increased CO2 emissions and urban traffic congestion. Regulations have to be put in place to suggest recommendations for mitigating these adverse effects, including mandating electric motorcycles for short-distance deliveries, charging higher fees to reflect the higher environmental costs, and managing demand. Finally, real-time block packaging and delivery by geography and the number of items ordered should be mandated to reduce trips and vehicular time on the road and, subsequently, the level of CO2 in the atmosphere.

The right to breathe is a core tenet of the right to life. Unfortunately, despite the numerous calls for effective change, most government policies and initiatives have failed to significantly make a difference to the essential quality of the air we breathe. Implementing such creative solutions, including more innovative agricultural investment to shape future practices and regulations such

as those in the food delivery sector, are only minor steps to building a pathway to a newer, cleaner, safer Delhi that over 33 million residents desperately deserve.

References:

HT News Desk. (2024, November 18). Delhi's toxic air equals smoking 49 cigarettes a day as AQI hits an alarming 978. *Hindustan Times*. https://www.hindustantimes.com/india-news/how-many-cigarettes-are-you-smoking-everyday-delhi-other-key-states-and-their-aqi-levels-haryana-ladakh-101731917279794.html

Inhalable Particulate Matter and Health (PM2.5 and PM10) | California Air Resources Board. (n.d.). https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health

Jafari, A. J., Charkhloo, E., & Pasalari, H. (2021). Urban air pollution control policies and strategies: a systematic review. *Journal of Environmental Health Science and Engineering*, *19*(2), 1911–1940. https://doi.org/10.1007/s40201-021-00744-4

Krishnapriya, P. P., Pattanayak, S. K., Somanathan, E., Keil, A., Jat, M. L., Sidhu, H. S., & Shyamsundar, P. (2024). Mitigating agricultural residue burning: challenges and solutions across land classes in Punjab, India. *Deleted Journal*, *1*(1), 015001. https://doi.org/10.1088/2976-601x/ad2689

Matsuyuki, M., Chotib, N., Nurhasana, R., Antokida, Y., Fitrinitia, I. S., Shellasih, N. M., & Ningtyas, F. R. (2024). Assessment of the sustainability of online food delivery from the perspective of CO2 emissions and transport intensity: A case study in Jakarta. *Transportation Research Interdisciplinary Perspectives*, *27*, 101200. https://doi.org/10.1016/j.trip.2024.101200

Raha, A. (2025, February 6). *Do you know the cost of Delhi's air pollution?* EPIC-India. https://epic.uchicago.in/do-you-know-the-cost-of-delhis-air-pollution/

The World Air Quality Index project. (n.d.). *Delhi Institute of Tool Engineering, Wazirpur, Delhi, Delhi Air Pollution: Real-time Air Quality Index*. aqicn.org. https://aqicn.org/city/delhi/delhi-institute-of-tool-engineering--wazirpur/

World Health Organization. (2021). *WHO global air quality guidelines*. https://iris.who.int/bitstream/handle/10665/345329/9789240034228-eng.pdf

Yin, X., Kang, S., Rupakheti, M., De Foy, B., Li, P., Yang, J., Wu, K., Zhang, Q., & Rupakheti, D. (2021). Influence of transboundary air pollution on air quality in southwestern China. *Geoscience Frontiers*, *12*(6), 101239. https://doi.org/10.1016/j.gsf.2021.101239