

# Gender and Economic Policy Discussion Forum

## The Gendered Effects of Air Pollution

FORUM XXVII | 5 OCTOBER 2018

BRIEFING NOTE 27

### HIGHLIGHTS / KEY POINTS

- There is a direct connection between the health and the sustainable development. One cannot be very productive due to exposure to high air pollution and as a result there is a loss to one's healthy years. In not being productive for one's own, family, country is indirectly a bigger loss to the economy. That's why health is fundamental to the sustainable development.
- Air pollution is well known for causing premature deaths. So if one is supposed to live seventy healthy years of life, but due to exposure of high air pollution, one loses at least 3-5 years of healthy life depending on the exposure of air pollution and it is a premature death because of the air pollution exposure. That is why it becomes significant to draw the link between air pollution and climate change. Because if we talk about the mitigation only in terms of GHG emissions, people dying from local effects would not be accounted for.
- The problem needs to be understood in its complexity. So when we record people's deaths because of exposure to air pollution, it doesn't reflect an exact understanding as exposure is not evenly distributed.
- Exposure rate depends on time spent in polluting environment. High figures of air pollution reported in media pertain to particulate matter high concentration, which is the ambient air concentration and not the exposure concentration. There is a significant difference between ambient concentration and exposure concentration. Thus exposure is a function of a) proximity to the source and b) breathing rate of an individual. Ventilation and filters are used if facing indoor pollution however the time spent is very critical whether facing indoor or outdoor pollution.

The 27<sup>th</sup> Gender and Economic Policy Discussion Forum organized on 5<sup>th</sup> Oct 2018 discussed the ill-effects of air pollution and its gendered implications. The effort was to analyse how the city as well as rural spaces are getting restricted and inaccessible because of the gendered impacts of air pollution as well as how does gender play a role on the adverse effects on health and its inequalities. The speakers at the forum were Suresh Jain (Indian Institute of Technology (IIT) Tirupati), Tanushree Ganguly (Centre for Science and Environment), Sandeep Narwani (Member, AAP). The discussion was chaired and moderated by Jyoti Parekh (IRADe).

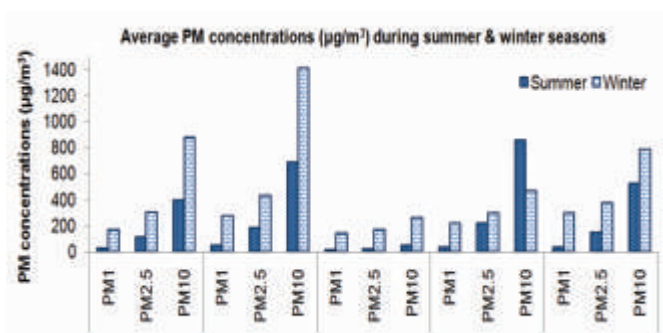
### Health Inequalities and exposure concentrations

The report of the 'Steering Committee on Air pollution and health related issues' (2015), talks about a focus on an 'exposure based' understanding of analysing the impact of air pollution and its effects. The report emphasizes the integrated exposure of the population to all sources of air pollution – household and ambient, since health outcomes are determined by total exposure to air pollutants. An exposure-based approach can therefore aid in identifying (and prioritizing for policy action) those sources that significantly affect exposure (p.9).

Jain<sup>1</sup> elaborated on the number of determinants which influence or cause health inequality in the system. First one is the unequal exposure among individuals, in the way how air pollution is distributed in a particular city or an area. However this doesn't mean that the effect of pollution is higher only where the source is, it might be hitting other places as well. The air quality in the environment has to be seen in the matrix of air, water, waste, with air being the most complicated in the matrix because as soon as it gets mixed within the atmosphere the problem gets attributed several folds. Jain further reiterated that women are more vulnerable as they are exposed to very high air pollution, specifically in the rural setting where women preparing meals for their family get exposed to tremendous high amount of air pollution. However, dust may not be that toxic as compared to pollutants emitted from different combustion sources like vehicular emissions, industrial emissions and refused burning in the cities as it contains majorly ultra-fine and nanoparticles, directly going to lungs, and some of them are carcinogenic as well. This specifically goes for the vulnerable groups like the outdoor workers, street vendors, sweepers, traffic police personnel, auto-rickshaw drivers etc. who do not configure in policy frameworks or city planning.

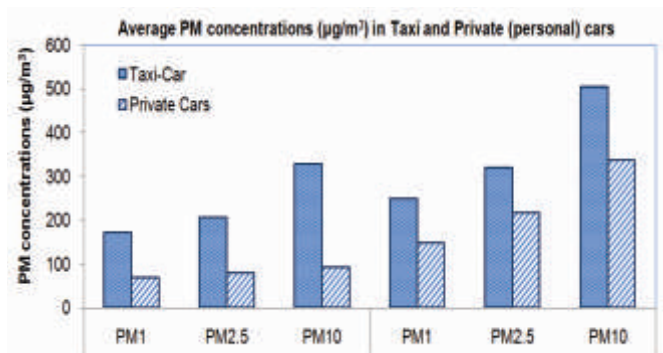
Jain<sup>2</sup> elaborates on a study that they conducted, with women who were working in the construction industry. The study concluded by showing that the nature of jobs that women get, are such that they are exposed to very high levels of air pollution and dust. To add to this, their children often accompany them to the construction sites, which lead to affecting the health of the children too. Further Jain presented the case on health inequality, by showing data on

particulate matter. People who are in cars release more pollutants, whereas who are travelling in public transport to actually support those in cars, they are exposed to more pollutants, which is a huge problem.



Source: Jain (2017), GEP Oct 2018

Jain (Jain, 2017)<sup>3</sup> argued that how people travelling in public transport have to carry the burden of those living in luxury. This inequality makes them lose their healthy years. The taxis and hired cars emit nearly 30-50 percent more pollution than personal cars, because personal cars are maintained better in comparison to taxis. This makes it very important for the vehicles to be maintained and their inspection as an important need.



Source: Jain (2017), GEP Oct 2018

In the context to household air pollution, Jain (2017)<sup>4</sup> elaborated that in the process of cooking; there are three types of kitchen: one, where the kitchen is completely enclosed; second, where kitchen is semi-enclosed; and

third, is an open kitchen, something like in the verandah. Keeping several factors in mind, merely this factor of the type of kitchen can present a lot of variation. Simple awareness about the effect on health and the kind of emissions can help in protection of the women. Jain shows through their study that using the improved cook stove, records a significant reduction even in the same conditions, even without changing the style of the kitchen. There is a 60-70% reduction in the emissions. However there is a catch, because emissions are in microgram per meter cube mass, and if the chambers of the improved cook-stove are not designed carefully, the mass is going to go down. And women while preparing meals are being exposed to those micro tiny particles. Indirectly it's a trade-off, in terms of the net emission going down but with the nano or ultra-fine particles the number keeps increasing. So there needs to be caution placed, when thinking about the improved cook-stove.



Source: Jain, GEP Oct 2018

**The Gendered Reality: a call for effective policy making**

A very recent study by the Centre for Science and Environment (2018), tells us that how it is not just important to look at the unprecedented growth of cities in terms of demand and spread but also at how people commute. So looking at not just

the increase of number of vehicles or the spread of populations but also looking at the travel plan or the trip average of commuters. In looking at the trip average or commuting practices, the movement, use of vehicles and public transport usage can be analysed. Also by having an estimate of the commuting practices, one can also ascertain how much household income gets spent in transport, how are the commuting practices gendered, how does pollution in cities genders mobility and commuting practices. This can help determine both the access as well as the impact of air pollution.

Ganguly<sup>5</sup> asked the question on how air pollution affects genders differently. She contemplated around the concerns of safety that prevent women from taking environmentally conscious decisions. For instance, the simple decision to be able to use and commute through public transport or not, depends on the nature of safety provided and felt by women.

She<sup>6</sup> elaborated on the difference between ambient and exposure concentration, by giving a hypothetical situation of what happens when one is sitting on the ceiling of the industry and is very close to the source, one is definitely exposed to more pollution. There is a significant difference between ambient concentration and exposure concentration. Exposure is a function of a) proximity to the source and b) breathing rate of an individual. The fundamental question then, is to think about how are women pathologically and clinically, more vulnerable to air pollution? The global burden of disease (GBD) picks up different factors which actually cause mortality or years of healthy life's loss and it calculates risk attribution from factor. When talking about

pollution and related health impacts, low respiratory infections, COPD, heart disease and strokes, they are all primary ailments that are caused due to air pollution. There is a direct link between air pollution and these ailments. And when it comes to low respiratory infections and strokes, women are more vulnerable based on the GBD data for the year 2016.

### Percentage of premature deaths in 2016 due to exposure to ambient air pollution

Cause	Male	Female
Lower Respiratory Infection	4.4	5.83
Chronic Obstructive Pulmonary Disorder	8.7	8.59
Ischemic Heart Disease	19.6	15.57
Stroke	6.9	7.3

Source: GBD India Compare, 2016, online visualization (Ganguly, GEP Oct 2018)

Further she elaborated on how gender mainstreaming should be accounted for in clean air policy making. What is and what does the clean air planning process entail? The first process is to understand the scale of the problem, its spatial variation and its significance. The second piece of the puzzle is to understand why there is a problem and which is why a hotspot analysis is required. The third process is to attend to source apportionment studies, which basically computes the relative contribution of sources. For instance in Delhi, in winters as people talk about regional contributions to air pollution through crop burning etc, source apportionment studies help find out the relative proportion of these regional contributions. Finally, the major

piece of the puzzle is to devise strategies, so that as policy makers move towards a comprehensive action plan in Delhi, there is also a graded response action plan in place.

Ganguly<sup>7</sup> contemplated on why do policies keep falling short? One reason definitely is superficial understanding of the problem and second is that most of the solutions are curative rather than being preventive. She elaborated on two schemes, Ujjwala and Nirbhaya. With the Ujjwala scheme the motive was to enhance the access to clean energy and also free LPG connections. However what has happened is that even though there have been 5.61 crore LPG connections that have been given out so far, at the same time the latest numbers show that the inactive connections stand at 3.82 crore. Perhaps then what is happening is that people have been economizing on the amount of LPG, they use because refilling for them is expensive. Thus even though the motive has been to cut down the usage of unclean fuel however the implementation and the short sightedness of the policy shows the inability of capacity of people to refill, which asks a reflection on the nature of policies and their implementation.

The second policy that Ganguly discussed was the Nirbhaya fund, which wanted to impact the decisions that women were taking, however it turned out again to being curative than preventive. So the fund talks about installation of CCTV cameras, panic buttons and GPS systems in buses to track them. However we don't have enough buses to commute, before even thinking about CCTV's and panic buttons. And at the same time, safety and inclusive cities are based more on the foundation of creative



urban design and vibrant urban centres that allow women mobility with more freedom rather than CCTV cameras that actually are more mechanical and inhibit any understanding of safety or inclusion.

Ganguly<sup>8</sup> elaborated this further by giving different instances to explain the gendered nature of how pollution, environment and access to policy interventions that affect the everyday choices and environmentally informed decisions by women and men. She spoke of a woman who sells tea on the roadside and uses coal-pellets even when she has the cylinder that she doesn't manage to use because to use it she will have to carry it back home every night otherwise it would get stolen. At the same time the cylinder wouldn't be able to hold huge pans that this woman used at her stall. This explains how interventions and solutions need to be planned, understanding the choices that women have to make in their everyday lives.

Another instance that she<sup>9</sup> mentioned is why would men and women mostly prefer using app based cab services late at night despite availability of metro services. Is the problem, the lack of want to make environmentally conscious choices? The problem is not about access to energy but about conscious choice. Hence, the first piece of the puzzle is about understanding 'what people want'. Only pushing for policies, which assume that they will create an impact alongside tricky implementation, is not going to solve the issue, unless there is an understanding of people's needs. The second point is the socio-economic repercussion of the proposed measures. For instance, why do people prefer different modes of transport during different

hours of the day, for example, early in the morning when traffic is high one could use the public transport, but women coming back from work late at night from peripheries of the city usually have a cab service set because even companies don't want their women employees to travel in public transport or alone at night. Thus safety becomes a big concern. And that is why even when the questions look very simple *prima facie* but they do require and call for a deeper understanding of what is going on.

Urban commute patterns in terms of, how men and women use cities differently, what is the relative proportion of household and professional responsibility, affordability, all such factors need to be accounted for. In another instance, as winters come, pollution levels go off the charts and all the construction activities get banned in Delhi. However what happens when these construction bans are put in place for male and female construction workers or daily wage labourers. Do governments think about them when such proposals come into place? The government is today, pushing for smart cities, technologically advanced cities, intelligent transportation systems, lot of investment on urban infrastructure; but how do we define and understand a smart and gender sensitive city?

### **View from an insider!**

A Lancet study (2017) analyses how "pollution is intimately linked to global climate change". It shows that, fuel combustion—fossil fuel combustion in high-income and middle-income countries, and biomass burning in inefficient cookstoves, open fires, agricultural burns, forest burning, and obsolete brick kilns in low-income

countries—accounts for 85% of airborne particulate pollution and “for almost all pollution is by oxides of sulphur and nitrogen. Further they content that pollution is very costly; it is responsible for productivity losses, health-care costs, and costs resulting from damages to ecosystems. But despite the great magnitude of these costs, they are largely invisible and often are not recognised as caused by pollution (ibid.).

Narwani<sup>10</sup> cites that one out of nine premature deaths globally, is attributed to air pollution, even when the health minister denies that air pollution can be a cause of death. In that sense there is no discourse that has been initiated on deaths because of air pollution. 91% of the people living worldwide live in zones that have high air pollution. There are research studies which indicate that women are far more prone to asthma because of air pollution and then at the same time there is the gender disparity in health care in India which further shows that women have far lesser health care access. India’s mortality rate due to respiratory diseases is twice as much as China’s. Even though China was also very bad in terms of air pollution in the past but they have improved drastically. He further explained the gendered effects in terms of, how research shows that air pollution leads to increase in temperatures and other climatic changes, which leads to an increase in ground level ozone that causes adverse effects on crop yield and quality causing the brunt mostly for women farmers with decreased revenues and losses.

In citing these studies he<sup>11</sup> then spoke about the odd-even car policy that was implemented in Delhi in 2015, in a bid to reduce air pollution in Delhi. One of the clauses in that policy (which

remained highly debated and contested) included an exemption for women by providing 50% reservations during the odd-even phase. Even though he cited that there are only about 8.5% licences in Delhi that are issued to women (according to the Ministry to Transport) and the number of women who drive on the roads are very less. And therefore the exemption to women got adopted because of security and safety concerns, especially in Delhi. However it remained contested with people filing PIL’s against this exemption, asking the court if a woman drives with three other men, whether it should be exempted and the like. It was reflective of the fact that more work needed to be done on the policy and the gendering a policy did not only mean exempting women.

There is a statistic from Berkeley which states that cooking in an open kitchen is like burning 400 cigarettes in an hour. And state agencies continue to remain in denial to the number of diseases that open cooking can cause. Speaking about the Ujjwala Scheme, Narwani<sup>12</sup> cited that 85% of the rural households are on bio-mass, coal or kerosene. Through the Ujjwala scheme, the government bears a cost of about sixteen hundred rupees per connection and each household spends fifteen hundred rupees to get a new stove and LPG connection. However the effective implementation of the policy required more data especially at the district level, more awareness and extra incentives to be able to reach to the maximum number of women users.

## Conclusion and Recommendations

The discussion pointed to the various layers in the way in which gendering of systems in terms

of access to services as well as effects of air pollution, affect the populations at large. Whether it is the policy making interventions, health inequalities or growing demands of the choices and needs of populations especially in cities, the forum opened up the complexity of a highly reported issue and contemplated the nuances to think about the solutions.

- Certain policies must be devised for the outdoor workers and vulnerable groups, where certain innovative solutions can be targeted or policy instruments put in place, especially in such sectors so that facilities are provided.
- Prioritization to mitigation measures needs to be given. Also so that beneficiaries of the proposed schemes can be made part of the policies making process. The women or the traffic policemen, who are actually victims of the setup need to be considered as

stakeholders. Every consultation should have a representation from them.

- Low emission zones should be seen as examples where movement is not restricted. People usually burn the refuse as that is an easy solution. Burning the waste in any amount causes excessive pollution (even when compared to other sources of pollution), significantly contributing to the environment negatively.
- It is important to begin to think about a change in behaviour and the lifestyle, in reducing pollution as compared to the need for any technology intervention.
- Policy making on all issues should begin with, aspire to and be formulated keeping the gender aspect in focus. Gender must come in the beginning of designing the policy and not as a supplementary annexure.

## Endnotes

<sup>1</sup> Suresh Jain, XXVII GEP Discussion Forum Oct 2018

<sup>2</sup> Ibid.

<sup>3</sup> Jain, S., 2017. Exposure to in-vehicle respirable particulate matter in passenger vehicles under different ventilation conditions and seasons. *Sustainable Environment Research*, 27: 87-94.

<sup>4</sup> Sharma, D., Jain, S., 2019. Impact of intervention of biomass cookstove technologies and kitchen characteristics on indoor air quality and human exposure in rural settings of India. *Environment International*, 123, 240-255.

<sup>5</sup> Tanushree Ganguly, XXVII GEP Discussion Forum Oct 2018

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Sandeep Narwani, XXVII GEP Discussion Forum Oct 2018

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

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The Lancet Commissions. (2017). The Lancet Commission on pollution and health.

## Speakers at the Forum

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## Gender and Economic Policy Discussion Forum

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