



Cooking Fuel Policy in India & Empowerment of Women

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Editorial

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Abstract

Population has expanded significantly over the years and the rate of urbanisation has been on the rise. This has put major stress on available resources that were non-existent or not as apparent in the last few years. Theories of social change, state that when changes of any nature occur in a society, it brings about varied alterations in human interactions and thereby modify the functioning of various institutions in the society. The focus of this Chapter is limited to understanding the evolution of the nature of fuel used in India for cooking. The author here has tried to explore how the kind of fuel used for this purpose has evolved over the years and how this has in turn empowered women and modified their standing in the society.

Keywords: Cooking Fuel; Particulate Matter; Air Pollution; Ambient Air Quality; LPG; PNG; Air Quality Index; Women Empowerment

Particulate Pollution and Environment

In 2020, India was ranked 3rd amongst 106 countries in the Air Quality Index Ranking (AQI)¹. The air that we breathe in every day is especially harmful for sensitive groups² of persons, like those with comorbidities such as diabetics, high blood pressure, cardiovascular or other respiratory ailments. The AQI indicates the amount of harmful particulate matter in the atmosphere. PM_{2.5} and PM₁₀ are two sizes of particulate matter that is of major concern to the health of the environment and species. This is a cause of worry over and above the general stress about emissions of various greenhouse gases (GHGs) and global warming. Particulate matter is worrisome because of its ability to enter the human body surpassing³ all its barrier systems and depositing itself on various organs thereby leading to both short term and

long-term health ailments. The health ailments resulting from long term and short-term exposure to particulate matter are tuberculosis, stunted growth and reduced weight of children born to pregnant mothers exposed to such polluted air⁴, or a permanent mutations in our DNA sequence⁵ etc.

But the presence of how much of PM_{2.5} and PM₁₀ in the atmosphere can be labelled as harmful, is unknown to the mass at large. The World Health Organisation (WHO) has regularly revised the limit of particulate matter, above which the effect on health is definitely grave; but it has always shied away from prescribing the 'safe' exposure limit to particulate matters, because the research is ongoing and it hasn't been established yet as to how much deposition of particulate

1 <https://www.iqair.com/india>

2 Michael Eric Lytton, et al, "Ambient air pollution from Urban Transport in India", L1 Economic and Political Weekly, 46 (2016)

3 Ibid.

4 WHO, IEA, GACC, UNDP and World Bank, Achieving Universal Access to Clean and Modern Cooking Fuels and Technologies, High Level Political Forum on Sustainable Development, (Feb., 12 2018), available at https://sustainabledevelopment.un.org/content/documents/17465PB_2_Draft.pdf (Last visited on Aug., 04 2021)

5 Supra note 2 at 48.

matter on one's adipose tissue or breast milk⁶ can be considered safe in the long run; even if it doesn't sound any alarms in the short run.

As a society we always tend to relate the emission of particulate matter with motorized transportation. We blame the tailpipe emission of especially the older fleets of cars still in operation in various city roads for the black smoke that we visibly have to breathe in when we step out onto our streets. But though pollution from transportation is one of the many sources of particulate matter, there is a lesser-known source hiding behind our kitchen doors that is surreptitiously causing us harm on an everyday basis: the emissions from our *chulhas* and gas stoves.

It is true that particulate matter can be emitted into the atmosphere from a multitude of sources: right from the type of fuel we use to power our vehicles, generate our electricity and to cook our food on. However, in this chapter the author is primarily concerned with the type of fuel used for cooking and how it contributes to the particulate matter content in the atmosphere.

This chapter explores how the choice to gradually shift away from polluting fuel towards cleaner cooking fuel was incredibly slow because of the gender dynamics entrenched in India and how we have a long way to go before we can cut down the emissions from our kitchen and uplift half of the population beyond their existing subservient position in the society.

Cooking Fuel used in Rural Households

Choice of cooking fuel ranges from traditional cooking fuel options like dry wood, dung, crop residue, unprocessed coal⁷, and kerosene; to cleaner options of fuels like liquified petroleum gas (LPG)⁸, piped natural gas (PNG)⁹, solar

photovaltic cooking (PVC)¹⁰ and ethanol fuel¹¹ and biogas fuel.

Though there are data that show that Indian households have from the 1990s to 2000s made a transition¹² towards cleaner fuel in their kitchens and above 50% of the urban households use clean cooking fuel, it is also true according to 2015-2016 Demographic and Health survey in India, that around three fourth of Indian houses in the rural area fuel their traditional stove with cow dungs and wood; which in turn causes particulate pollution right within one's household. This impacts mainly women, since they are the primary cooks in an Indian household¹³.

Children, especially infants and toddlers also tend to inhale these polluting particles. Since caregiving responsibilities are also entrusted on woman as it is considered to be a natural extension of their biological function, their children tend to hover around them while they toil all day at cooking meals for their family and tend to inhale the air along with their mother. The fact that children are exposed to such polluted atmosphere in their growing age, increases the potential for negative impact on their respiratory organs and overall growth.¹⁴ In comparison to this, since male members of the family step out of the house into their respective paid employment engagement, they tend to avoid inhaling in the particulate matter directly from the *chulhas*, at least for the immediate future.

Though there have been several schemes and policies initiated by the government in propelling the shift in the rural areas towards cleaner technologies, most rural households have surprisingly gone back to using these traditional fuels to keep the fire burning in their kitchen.

Why are Traditional Cooking Fuel Still used?

It is amply clear by now that the choice of cooking fuel impacts the respiratory health of mothers and children in the short run and the entire family, village and society in the long run. Then why is it that rural households continue to use these unhealthy types of cooking fuel?

6 National Research Council 2010. Global Sources of Local Pollution: An Assessment of Long-Range Transport of Key Air Pollutants to and from the United States. (Washington, DC, 2010) available at <https://doi.org/10.17226/12743> (Last visited on Aug., 04 2021)

7 Dean Spears, Air, 91 (Harper Collins, Noida, 1st edn., 2019).

8 Aishwarya Krishnan, "What Makes Piped Cooking Gas So User Friendly?", The Economic Times, Nov 28, 2019, available at <https://economictimes.indiatimes.com/industry/energy/oil-gas/what-makes-piped-cooking-gas-so-user-friendly/articleshow/72270818.cms?from=mdr> (Last visited on Aug., 13 2021)

9 Press Trust of India, "Centre wants to bring piped gas to Kolkata in one yr: Pradhan", Business Standard, January 12, 2020, available at https://www.business-standard.com/article/pti-stories/centre-wants-to-bring-piped-gas-to-kolkata-in-one-yr-pradhan-120011100978_1.html (Last visited on Aug., 12 2021)

10 Saurabh Kumar and Anupam Chatterjee, "Power to the kitchen: Govt. to promote electricity as cooking fuel", Financial Express, April 25, 2019, available at <https://www.financialexpress.com/economy/after-completion-of-100-electrification-govt-keen-to-promote-power-as-cooking-fuel/1558263/> (Last visited on Aug., 12 2021)

11 Supra note 4 at 48.

12 Supra note 7 at 100

13 Jyoti K. Parikh et al, Providing Clean Cooking Fuel in India: Challenges and solutions, 2016, International Institute for Sustainable Development, available at https://www.iisd.org/system/files/publications/clean-cooking-india-challenges-solutions_0.pdf (Last visited on Aug., 04 2021)

14 Supra note 7 at 92

One obvious reason appears to be cost. LPG in India costs anywhere between Rs. 834 to Rs 861 for a 14.2Kg cylinder¹⁵. Use of LPG usually requires a household to have two cylinders, so that when the gas runs out you have another filled cylinder to immediately replace your empty one with and keep the fire burning in the kitchen. Now, let's consider the second type of clean fuel available, piped natural gas (PNG). This has a high cost of installation of about Rs. 6000¹⁶ (refundable security deposit) but a relatively low cost for using the. The monthly charges for using PNG gas as of 2021 ranges anywhere between Rs. 28.41 per standard cubic meter (SCM)¹⁷ to Rs. 32.67 per SCM.

The third type of clean fuel in use in India are the solar photovoltaic cooking (PVC) stoves. Use of this stove presupposes the existence of seamless electricity supply. But this is perhaps the most expensive type of cooking fuel amongst the three types of clean fuel mentioned above. The cost of installing a solar photovoltaic cooking system in households amounts to around Rs. 50,000/-¹⁸, something that will definitely sound luxurious in an urban household and outright outlandish in a rural one.

In comparison to the above access to dry wood, cow dung and crop residue is easier and cheaper for a rural household.

However, when one tries to explore the problem of high cost further and tries to remedy it by increasing the purchasing power of households, one realises that the real problem is not related to economic capacity of a household but something that is engrained deep in a society's gender dynamics.

It does appear superficially that people choose traditional solid fuels because it is cheaper than the expensive alternative of clean fuel. But there have been studies conducted to understand if households shift to cleaner cooking fuel when their economic status rises. In such experiments households have been given livestock free of cost which in turn has increased their immediate economic status. There has been

15 Tamal Nandi, "LPG cylinder prices to become costlier from today. Check the latest rates", Livemint, July 01, 2021, available at <https://www.livemint.com/industry/energy/lpg-cylinder-prices-to-become-costlier-from-today-check-the-latest-rates-11625112074916.html> (Last visited on July 04 2021)

16 Anonymous, "Here's how you can get new IGL connection", India Today, September 03 2019, available at <https://www.indiatoday.in/information/story/here-s-how-you-can-get-new-igl-connection-1594774-2019-09-03> (Last visited on July 11 2021)

17 Express Web Desk, "IGL hikes CNG and PNG prices: Here's what you need to pay", The Indian Express, March 02 2021, available at <https://indianexpress.com/article/business/commodities/igl-indraprastha-gas-hikes-cng-png-natural-gas-prices-delhi-ncr-noida-greater-noida-ghaziabad-gurugram-march-2-7210598/> (Last visited on July 11 2021)

18 Supra note 10.

support extended towards giving chimney stoves too to such households, to ensure that pollutants do not hover in the ambient air and can be directed out of the house and away from the vicinity of the cook. However, the households have depicted a strange behaviour inspite of the change in economic status.

Inspite of rising up the economic ladder, households have been found to not shift to clean cooking fuel; and households that were given free chimney stoves, have been found to erratically use them or stop using them altogether. A possible reason predicted by researchers was that once a household's economic status improved, it actually gained more access to livestock, which in turn made it possible for them to generate solid fuel within their own house. This actually made traditional fuel cost-free which was not the case before they were given ownership to livestock. Now, these rural households did not have to purchase cow dung from the market.¹⁹

Thus, the ambient air quality continued to remain status quo if not decrease. Scholars have suggested that inspite of the visible respiratory ailment experienced by the female cooks of the household, they *chose* to continue to use the same, because they actually did not have financial decision-making capacity in their households and did not enjoy any real choice in their lives. The choice and decision making capacity was limited to the male members of the family who did not have to face the reality of the smoke in their kitchens like their wives and mothers.

So, it is amply clear that though cost of clean fuel is high and may prove to be difficult for especially rural households to shift to, the deeper reason is the lack of women's decision-making capacity prevalent especially in rural households.

Changes in Cooking Fuel Policies in India

There have been several efforts taken by the government towards improving access to clean cooking fuels and in this section, the author will try to elaborate on the same and assess if it has truly improved the proliferation of healthier cooking fuel technology in rural households and the village in turn.

As has been explained in the previous section, the impediment faced in shifting to cleaner fuel is embedded in the way India perceives its women. Till, we do not evolve the way women are perceived and treated in the society, the shift

19 PTI, "All households to soon have clean cooking fuel: Dharmendra Pradhan", The Economic Times, 2019, available at <https://economictimes.indiatimes.com/industry/energy/oil-gas/all-households-to-soon-have-clean-cooking-fuel-dharmendra-pradhan/articleshow/67925218.cms?from=mdr> (Last visited on July 15 2021)

towards cleaner cooking fuel and the achievement of goal towards improving the AQI will remain a distant dream.

Cleaner cooking fuels comprise: electricity, liquified petroleum gas, piped natural gas, biogas, solar and ethanol fuels²⁰. Since it is difficult to shift directly from polluting traditional fuels to cleaner fuels in one leap, there are transitional solutions in the form of biomass cooking stoves that has been encouraged and promoted by the government. The improvement however is not limited to changing the type of cooking fuel. Reducing particulate pollution requires an overhaul of the cooking system in place. It requires an improvement in cooking technology comprising an increase in efficiency of cooking appliances, ventilation system²¹, and other peripheral paraphernalia like smoothening the production, distribution, retailing and servicing channels²².

In the following sub-sections we will explore the various policies brought by the government to encourage the shift towards cleaner cooking fuels to uplift the health conditions of women and to reduce the particulate pollution in the air.

LPG Cylinders

The central government in the year 2016 brought about the Pradhan Mantri Ujjwala Yojana²³, LPG cylinders were given away for free before the state elections²⁴. Around 6.4 crore²⁵ LPG connections have been provided since 2016-2019. It did take effort at reducing the financial and other eligibility criteria that existed for securing licenses²⁶, but what this scheme did not address was sorting out the mechanism and funding for subsequent refilling of these cylinders.

The other thing that the government did was mandate public sector Oil Marketing Companies (OMCs) to subsidise fuel to make such cooking fuel more affordable to the lower rung of the society²⁷. The subsidy offered by the one of the three public sector OMCs, Indian Oil Corporation, was helpful

since it was as high as Rs 18,662.81 crore for 2018-2019 and Rs. 13,048.412 crore for 2019-2020. But what is worrisome is that the subsidy offered in the year 2020-2021 came down significantly to Rs. 3,008.44 crore. This is especially worrisome at a time when the crude oil prices have been on the rise²⁸.

Hybrid Cooking System

It isn't easy for a rural household to abandon the familiar traditional cooking fuel for the unknown and more expensive form of cooking fuel, even if it is promoted by the government. The government understood this mental block and tried to bring in a hybrid cooking tool to ensure that the transition to cleaner fuel was gradual. This gradual move to a hybrid system was intended to be for a brief interim period. In the year 1986 the government had launched the National Programme on Improved Chulhas (NPIC) that supported the use of Improved Biomass Cookstoves (ICS). This scheme was discontinued in 2002²⁹.

In 2014, the government launched the Unnat Chulha Abhiyan under which approximately 6,940 family type and approximately 849 community type Improved Cook Stoves (ICS) were distributed between 2014-2018 to reduce reliance on traditional cooking system³⁰.

Waste to Biogas

In the year 2018, we integrated our waste management system with energy production and hoped to create a circular economy of sorts. The New National Biogas and Organic Manure Programme (NNBOMP) was launched in 2018 and has been continued through 2020³¹. Under this biogas plants will treat waste and convert it into energy. One of the listed objectives of this scheme was to reduce the drudgery of women and to intern improve their social status.

Piped Natural Gas

Natural Gas has many benefits in various industries

20 Supra note 4

21 Susmita Patnaik and Saurabh Tripathi, Access to Clean Cooking Energy in India: State of the Sector, 2017, Council for Energy, Environment and Water, available at <https://www.ceew.in/sites/default/files/CEEW-Clean-Cooking-Energy-Access-in-India-21Oct17.pdf> (Last visited on July 15 2021)

22 Supra note 4

23 Kuwar Singh, "Oil Marketing Companies made lower LPG subsidy pay-out", Business Line, April 10 2021, available at <https://www.thehindubusinessline.com/markets/commodities/oil-marketing-companies-made-lower-lpg-subsidy-pay-out/article34278502.ece> (Last visited on July 16 2021)

24 Supra note 7 at 101

25 Supra note 19

26 Supra note 21

27 Ibid.

28 Supra note 23

29 Supra note 21

30 PIB, "Government making efforts to reduce dependence on traditional biomass cooking", Ministry of New and Renewable Energy, 2018, available at <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1525934> (Last visited on Aug 09 2021)

31 "E-file No.253/16/2017-BIOGAS", 2020, Ministry of New and Renewable Energy, 2020, available at https://mnre.gov.in/img/documents/uploads/file_s-1592215264726.pdf (Last visited on Jul 07 2021)

beyond its ability to release less GHGs³². One such benefit lies in fuelling our cooking machines. When natural gas is supplied through a pipeline in households it is called PNG. Unlike as is the case with encouraging use of LPG cylinders, to promote PNG we need to overhaul the infrastructural system in place³³. One receives the natural gas through a pipeline and pay a monthly fee for the same. Proliferation of PNG in rural household may be difficult, but it is being explored in the urban setup³⁴. LPG use can increase in the rural settings only if the urban populace shifts to PNG³⁵.

It appears that the shift may take a while before urban households decide to replace their LPG cylinders with a PNG line. As of 2020, only 6.3 percent of the fuel demanded in India comprises natural gas.

To ensure that we shift to at least 15% of energy use to natural gas by 2030³⁶, the government has been encouraging the setting up of gas distribution grid and encouraging private players to come forward to overhaul the infrastructural system in place to ensure seamless supply of natural gas. India has been taking efforts to shift away from its reliance to gas and the proposal to set up the 11th City Gas Distribution grid is just an indicator of its intention. Once the supply parameter is fixed possibly the relatively high cost of one-time installation may not discourage the populace as much.

Solar Based Cooking

At the outset, solar based cooking needs to be distinguished from electric cooking which runs on solar power. The latter suggests that electricity is generated from

solar panels/energy instead of thermal power etc. While solar based cooking required machinery to cook directly into a solar cooker.

The development of solar based cooking is still at its nascent stage and research is still ongoing on the same. As of 2017, the Ministry of Renewable Energy has provided subsidies to the sale and distribution of around 3,737 solar cookers. But the proliferation of the same is low, because of the inconvenience inherent in this form of clean energy-based cooking. One is dependent on the sunlight, which is erratic. It also requires the cooking to be done outdoors³⁷.

There aren't too many states that are considering solar based cooking as a viable option to shift the rural households to, but Haryana is one of them. Subsidy of Rs. 2100/- per sq meter of the collector area is being provided by the government, along with a 30% off on the cost of box type solar cookers³⁸.

Electricity Cooking Stove

Electricity based cooking is only possible once there is a seamless supply of electricity. Therefore, the government has through various policies is trying to achieve 100 per cent electrification across the country. In 2014 the Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) was launched with an aim to electrify 18,452 villages by 1st of May 2018. In 2018 the government launched a scheme, The Pradhan Mantri Sahaj Bijli Har Ghar Yojna with an investment of Rs. 16,320 to electrify all households at no cost to the poor and to provide the same to others at very low cost³⁹. In 2019, the scheme was dubbed 99.93% successful.⁴⁰

Solving the issue of lack of electricity supply in rural households dependent on traditional fuel may be the starting point, but it is definitely not the only thing required to encourage the transition to electricity-based cooking if we don't ensure, seamless flow of electricity. Blackouts are a reality in most rural households and there is also no real clarity on whether the electricity load being supplied to

32 Universal Technical Institute, CNG vs LPG vs LNG fuel: Understanding the Differences, Jan 30 2020, available at <https://www.uti.edu/blog/diesel/cng-lpg-lng-fuel> (Last visited on Jul 07 2021)

33 Susmita Patnaik et al, Roadmap for Access to Clean Cooking Energy in India, 2019, available at <https://www.ceew.in/sites/default/files/CEEW%20-%20Roadmap%20for%20Access%20to%20Clean%20Cooking%20Energy%20in%20India%20-%20Report%20%2031Oct19-min.pdf> (Last visited on Jul 07 2021)

34 Shweta Miriam Koshy, "Overcoming India's clean cooking challenge", DownToEarth, December 26 2019, available at <https://www.downtoearth.org.in/blog/energy/overcoming-india-s-clean-cooking-challenge-68562> (Last visited on Jul 10 2021)

35 Ibid.

36 PTI, "India's 11th city gas bidding round to be launched soon, says Pradhan", Business Standard, available at https://www.business-standard.com/article/economy-policy/india-s-11th-city-gas-bidding-round-to-be-launched-soon-says-pradhan-120091001956_1.html (Last visited on Jul 07 2021)

37 Surpa note 33 at 50.

38 Department of New and Renewable Energy, Govt. of Haryana, Solar Cooker Program 2011-2012, available at <https://hareda.gov.in/solar-cooker-program-2011-12/> (Last visited on Jul 07 2021)

39 Surpa note 33 at 51

40 Aparna Roy, "Will the Modi government be able to capitalise on the 'success' of the Saubhagya electrification drive this election?", The Times of India, Apr, 26, 2019, available at <https://timesofindia.indiatimes.com/blogs/toi-edit-page/will-the-modi-government-be-able-to-capitalise-on-the-success-of-the-saubhagya-electrification-drive-this-election/> (Last visited on Aug, 11 2021)

households have the capacity to fuel induction cookstoves that 1400W to 2100W of voltage⁴¹.

Concluding on Women's Status in the Cooking Gas Evolution Policies

It is evident from the above discussion that choice of cooking fuel and technology determines the woman's health as well as the health of the entire family and society. It is also clear that the government has recognised various forms of clean cooking fuel and technology and introduced schemes and strategies to ensure the shift from unhealthy particulate causing cooking fuels to cleaner ones. But the question that we need to address at this point, is if the above-mentioned knowledge and initiatives are enough to tackle the problem of air pollution and alongside remedy the problem of women's subordination in the household and the society.

This chapter has primarily focused on discussing the choice of cooking fuel used in rural households rather than the urban households but the subordination of women is a greater problem in our villages and the nature of cooking fuel is definitely more unclean in our suburbs than our cities.

In rural households, the choice of cooking fuel remains a range of traditional picks from cow dung, to dry wood etc. If a household owns more livestock it may mean that the household is economically better off, but it also means that they have cheaper and smoother access to traditional fuels.

Whereas in most urban household the form of cooking fuel that is prevalent is the LPG. LPG cylinders have been around for a long time and the predictability of getting a cylinder has increased over the years, where a new cylinder is delivered at one's house in less than a day which was unthinkable of a few years back. Along with it the presence of subsidies on LPG, make them a cheaper choice amongst the range of clean cooking fuel technology out there.

Though there too is an installation cost in using LPG cylinders which includes cost of buying a burner, regulator,

41 Surpa note 33 at 52

suraksha pipe etc⁴², it is still relatively low in comparison to the installation cost incurred for shifting to PNG, biogas machine⁴³.

But it is not just the cost that makes the urban household choose a cleaner cooking fuel like LPG. It is the fact that women tend to be more empowered in urban locales than in comparison to rural households. In the villages the problem of particulate emission from the use of solid fuels has been externalised primarily because the primary cooks of the household (women) are not those with decision making powers. Men are in control of the financial decisions. And, since the decision makers do not bear the primary harm of breathing in smoky air that is generated when cooking fuel is burned, they do not consider the harm internal, which in turn has made this harm appear like an externality⁴⁴.

Women who have more control in making various decisions in their life, like what to buy, what to do and where to travel to, were the ones who were also more likely to purchase LPG⁴⁵. Another interesting facet that came up in a research was that not all women in a rural setting lack agency in a uniform manner. If a woman is a mother of son(s) or her first born child is a son, she is given more respect and is hence able to exercise more real choice in her day to day life.⁴⁶

The author concludes that the particulate pollution from cooking is not as significant in the urban households as it is in the rural households. And the reason for the same is not just limited to the household income of the two categories of household. It goes deeper. Till we do not empower our women and devise a method to recognise the unpaid domestic work and care giving responsibilities our women discharge on an everyday basis, we, as a society will not be able to achieve a better quality of atmosphere or gender equality.

42 Supra note 13

43 Ibid.

44 Supra note 7 at 96

45 Ibid at 98

46 Ibid at 99

