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| **Interviewer name** | INTERVIEWER |
| **Sub-contractor organisation** | ARU |
| **Interview date** | XXXX |
| **Duration of interview audio recording** | 1 hour 20 minutes 55 seconds |
| **Face-to-face or virtual interview** | Virtual |
| **Interview participant** | |
| **Code** | I12 |
| **Participant name** | RESPONDENT |
| **Organisation name** | XXXX |
| **Gender** | Female |
| **Stakeholder category** | Researcher working for policy formulation at WHO and Government of India. Dean of Research, XXXX |
| **Country** | India |

Introduction

**INTERVIEWER** 00:11

Good morning, ma'am. Thank you so much for your time, we highly appreciate you participating in our study that aims to obtain a better understanding of energy access and gender equity in India.

Consent

So before we start, I would like to check that you completed certain certain mandatory requirements for the interview to be conducted. Number one is Have you completed and returned the consent form.

**RESPONDENT** 00:39

Yes

**INTERVIEWER** 00:41

For this interview, we would request you to share your experience and expertise as someone working within the energy sector as well as your views and opinions on gender equity in energy access. Is it okay if we record the interview for documentation purposes?

**RESPONDENT** 00:58

Yes

**INTERVIEWER** 01:00

The recorded interview will be transcribed for analysis, and a copy of the transcript will be shared with you for your approval. All the information we obtain serves the sole purpose of the study and will be seen only by the research team. Your name and other identifying features will not be used anywhere in reports and other publications emerging from the study. The interview will take more or less one hour. That's all good ma'am, then we can proceed with the interview.

**RESPONDENT** 01:26

All good, y'know... So if at all, you want to sort of cite some things, as you know, being attributed to me or my other colleagues whom I will mentioned during the course of the interview, please do so. So that, you know, it gets even more so for some of my colleagues who I'm sure I will bring up during the course of the interview. So that the work or the observations that stem from those particular studies are actually attributed to those groups or those individuals as the case may be, including mine.

**INTERVIEWER** 02:04

Yeah, sure, ma'am. I mean, as long as we are using something directly from your research, it will definitely be cited as such. Yeah.

Part 1

So starting off with the interview, can you start by briefly telling me a bit about your current role and, and the organization you're working for? Sure.

**RESPONDENT** 02:26

I, my name is RESPONDENT as you as you know, and I am a XXXXby training. XXXXXXX

**INTERVIEWER** 09:38

part of your voice is dropping and I'm losing some of the words.

**RESPONDENT** 09:42

Okay, you were texting me? You have to let me know. I am sorry if I missed your text. No, but is this better?

**INTERVIEWER** 09:54

Yeah, this is better. This is the last sentence I missed. Okay, so as I come to you,

**RESPONDENT** 09:59

okay. So I was saying that you know, that the gender disparities, especially in terms of decision making, I was needing to give credit to the state that you are based out of, XXXX. Except in a few progressive states, the decision making is not vested with, with the women as the head of the household, it's usually men who end up deciding on energy choices, especially the household sector. (Laughs) Yeah, it's not universally in, in any state in India, for that matter. But certainly, woman's choices that are major, y'know, the lack of women's choices in terms of household energy decisions is not.... not a trivial matter. But to understand what the exposure disparities are, coming up with instrumentation and technologies for us to be able to really measure these things, similar to how other air pollution has been measured, right, you know, ambient air pollution in cities, we've made so much advances in really being able to tell us which cities are beautiful, what the sources are in, what the toxicity is, what the health impacts are. But we really needed to get better at saying that Yeah, low and middle income countries and countries like India are, you know, potentially at risk or at risk from health hazards attributable to solid fuel use, because exposures are

**INTERVIEWER** 11:24

also I think, the eyeball onto air pollution generally like ambient air pollution and all this so much it has been in discussion, even with COVID and pre COVID, also, with all the Delhi situations and all it's really been a big topic of discussion, it has become election issues and all but indoor air pollution, which has been prevalent for such a long time, it is not anywhere close to the same exposure of exposure, in terms of people talking about it...

**RESPONDENT** 11:55

Yeah, so to bring the issue for discussion on the global table, we needed more science, on the ground. Empirical evidence on the ground, across exposure settings, that people in India experience. All the way from XXXX, where are the exposure profiles? You know, are the differences in exposure profiles? What are they rooted in? You know, can Clean Fuels really make a difference in people's exposures? If they were adopted at the household level, for example, if I were to switch to LPG Is this enough for me to be in a clean setting in a village that is primarily using, you know, biomass? You know, in the community, so to say that questions like this, so for the first XXXX years, we really wrapped ourselves in the ground realities, XXXXwas a major major part of, you know, being with us and actually conducting these ground level assessments, guiding, building capacities for our team to be able to deploy devices, you know, a lot of these devices are not even configured to measure in a household where the pollution levels can be so high within the first 15 minutes of lighting up a *chullah*, that the instrument will choke and die, literally, you know, so we needed to configure instruments that can typically measure a person's exposure over multiple days, multiple weeks, you know, so that we have a reliable way of saying that, okay, women are exposed to so much, children are exposed to so much, men are exposed to so much. So it's not just women who are at risk and we need to broaden the discourse, everybody's at risk communities are risk, but now, most recently, what we learn is even cities are at a major, major risk, they have always been at risk, but we are now able to document this that household sector emissions are responsible for a major major component to ambient concentrations, not in that little village where it is originating, but far away, including in mega cities like Delhi, including in mega cities, like Chennai, Nagpur, no, ... no name anything, you know, Mumbai, I'm not only talking about the first four, in the top tier cities, Chennai, Kolkata, Bangalore, I'm in Mumbai and Chennai, and Delhi, but Bangalore, Hyderabad and everywhere, wherever you want to look at, they're all surrounded by peri urban areas where solid fuel is still continuing to be used quite a bit. And we now recognize that that is, you know, just reducing that alone would bring us you know, within the reach of national ambient air quality standards in most parts of the country. Things like that. So, you know, first, before we went on to this discussion of, you know, how much health is impacted... We really wanted to say, Okay, if these are the exposures, then, you know, obviously, it must be associated with health, right? Because we already know, that's the basis for our air quality standards. So somehow, is solid fuel any different from automobile exhaust? Or is it different from power plant emissions, to sort of really understand that the health impacts because, you know, if you're looking at chronic health impacts, if the woman is cooking in the solid with solid fuels, and you're expecting COPD, or, you know, chronic lung disease, you know, and the woman is poor, she doesn't eat well, she doesn't sleep well, she doesn't have access to clean water, you know, she has multiple children, you know, there's so many things that are going to confirm before you are able to attribute her chronic lung disease to exposures to air pollution, you have to wait for a very, very long time to have these prospective cohort studies be conducted and nail it down 'yeah that chronic lung disease and woman that lung cancer', because the strength of association for all air pollution will be quite small, right? Compared to cigarette smoking, compared to say, you know, some other, you know, pesticide exposure or some other toxicant that has a much, much stronger effect here, the effect is not as strong, but it's a slow poison, you know, it's sort of for a long time. And so, everybody gets a little bit of the dose, over a very long time. So you don't even think of it acting on it, what happens is, you know, some people ... their quality of life, and I will come to the discussion later on, but what I'm saying is, before we got on to health, we did exposures, and for the next 10 years, we did have, you know, again with a global network of people, where we ended up saying okay, we want to make sure that health is improved. And therefore, can we look at you know, some technologies that will at least get the exposure down and then we will see if the health is also improved, so that you intervene. So, that's what that was the era of all these improved cookstoves. So 10 years, we spent evaluating technologies saying that can we look at... India already had a huge history of improved to last but not from a health point of view, it was mostly fuel efficiency or in or renewable energy framings that was making this sector you know, shift from traditional *chullahs* to improved *chullahs*, we all had a long history of knowing that women are not using it, many of them break down in a very easily it was very difficult to maintain. And that was the same story world over many improved groups of technologies were introduced. So, we said if we want to see improvements in health, let us at least try that some technologies to improve exposures and then we will see we improve some short-term health improvements. And as expected, we were thinking that this might not work, but it took us 10 years to prove it to the XXX that many of these inferior so called you know, improved of course not inferior sorry so called quote unquote improved technologies are not good enough. They are labeled improved, maybe for some other purposes, but not for health. They have no chance of improving health, because the kind of exposure reductions they can produce is not at all benchmarked against health-based standards for air pollution. So the WHO indoor air quality guideline for household fuel combustion was formulated in 2014 and released based on this, you know, decade long evidence of technologies, which did not seem to you know, meet health based benchmarks. LPG, electricity, you know, and solar has a very small presence, because solar devices are not so common, but at least in countries like India, where LPG programs are already at scale, you know, it is possible for us to supply 750 million people with LPG. Only the remaining 750 million are in solid fuels, right. So, at least we know how to do it for 750. It's a question of economics right if everybody can afford LPG, people would glad.. you know, gladly switch and government will not have to worry about subsidizing even more to get everybody this thing, but we have the infrastructure in place to actually supply LPG. And this was before the PMUY started, you know, so this discourse was, can we get, you know, can we get the energy sector The community to accept that it is not sufficient if you label a technology as improved, you have to label it as clean. Clean means when it is used routinely, it should produce exposures that do not pose any health risks based on what we know about air pollution and health, by and large. So we spent another 10 years into really establishing that, we were a major part of the XXX air quality guidelines, discussions serving as a technical committee members of which Kirk XXXXwas the chair. And then having established that, you know, LPG is a viable choice from a health point of view. Now, the question is, how can we make LPG viable as a programmatic choice for Government of India policy, for which we have to really document health benefits with the use of LPG that can be, you know, taken up as a benefit that comes out of the investments that they would make to make LPG more accessible. So, the first question, of course, you have to make LPG accessible, then we have to promote LPG us to a point where health is actually benefited. The PMUY program was informed greatly by XXXXand many of our research exercises wherein we demonstrated that, indeed, access to LPG is the first bar we have to cross regardless of use of LPG, that is the next bar to be crossed, because people will not be able to use LPG without additional economic, you know, support, so to say, the poorest of the poor, so to say. So there are many economic models that were developed. But we said, let's try to get access. And now we are at the crossroads where we are trying to see how much access how much use can begin to provide tangible benefits for health, especially for the most vulnerable groups of people. So if you are looking at young children, if you are looking at pregnant women, is it enough.. if we provide LPG during the pregnancy? Does it result in a better pregnancy outcome? It's not going to protect against the rest of the sequely that the woman might have, but at least she will have a healthy child, does it? Is it possible? These are questions we are asking because we recognize that to scale LPG availability and to scale LPG use straight away, you know, for a lifetime for 750 million people who cannot do it now, is not possible. It's not practical, we have to prioritize. Is it needed in a state like Uttar Pradesh first or needed in a state like Tamil Nadu where many other factors of pregnant women have already been taken care of? Can household air pollution provide that last mile benefit for us to overcome the deficits in birth weight that we are experiencing still, even with all the interventions that has happened even in a state like Tamil Nadu, compared to the Uttar Pradesh where many are or for that matter, Bihar or for that matter, West Bengal, where many of the other factors have not been solved. We are now trying to pin point where are the lowest hanging fruit for Government of India policies to go full blown to target vulnerable groups. So if there are no COPD patients in your household, for example, would you benefit by... if you're a poor family below poverty line family, if you can provide medical certificate saying that I have a COPD... You know, so would their quality of life be enhanced? Would their expenditures on chronic lung disease be reduced? Because your house is relatively smoke free, you know, think creatively about where can we let government know, these are the people who will really benefit. So get it to them first, then of course, everybody will benefit then when the economics becomes better. When we have the growth that comes out of that improvement and health, we will be able to actually, you know, give the energy clean energy benefit to all. But the goal is to really give everybody clean energy. And we have set ourselves a very, very ambitious target of 2030 along with the Sustainable Development Goals. So my group's job right now is to identify priority programmatic rollouts on the basis of health, for clean energy. That's where we are.

**INTERVIEWER** 25:01

A couple of questions from what you were talking about. One is he was saying about the improved cookstoves right that they were not really improved from the point of view of health. You were talking about things like smokeless *chullahs* and these kind of stuff, right?

25:16

Yes, smoke less. You know, I know what do you call improved smoke *chullahs*, so to say...Smokeless was the goal but they didn't end up being smokeless.

**INTERVIEWER** 25:33

The other thing I wanted to ask you was, why is the indoor... the access to clean cooking fuel being targeted into onto and being mapped onto LPG? The question I'm asking is based on the fact that you know, even today, we are largely dependent on external sources for oil, right? And LPG that is the source for LPG. And we are connected to market pricing and that market pricing fluctuations affect the pricing of LPG cylinders, I mean, if you look at only in the last two years, LPG cylinder prices have gone up almost by 150 to 200 rupees per cylinder, which makes it even more inaccessible to more and more groups of poor people, especially last year with COVID where you know, people had lower income, but the LPG cylinder prices have gone up, I mean, I can I hear my mother in law, talk about it, I mean, it affects somebody like her, who is definitely not part of the poor economic resource, you know, resource group. So, I cannot even imagine how the lower economic resource groups can sustain buying cylinders. So, why are we not looking at, I know, the solar stoves, the technology hasn't been cracked, but technology has been solved for electricity for solar, right. solar electricity is a program, which many governments and Indian government also has kind of put as a priority. So, why are we not looking at things like electric stoves, because electric stoves is also a solved, induction cooker, electric stoves, these are also solved technologies, which are available at quite a reasonable price in the market.

**RESPONDENT** 27:20

You raise a very important point, you know, the time or energy choices, and energy preferences of communities evolve is a complex one, sometimes it is possible to leapfrog. Sometimes it is not possible to leapfrog and many are looking at a population at scale. And if you're looking at LPG, you know, as one of the potential choices, amongst the choices that are currently available today, okay. electricity from solar is not at all about choice, right? In terms of clean energy. So the tech technology recommendations of who are agnostic to the choice of fuel or the choice of devices, it just means that the emissions from these devices have to be low enough such that people are not at risk for health. But nevertheless, we have to come up with Okay, where are these, you know, these are not some ivory tower technologies that people have no ability to relate to and actually start implementing, and actually, you know, start realizing the benefits for them. So the choice for LPG came from two or three. The point that you raised is very, very important one, you're already relying on, you know, petroleum imports, right in our country. Okay. Are we not going to rely on petroleum imports for our cars? Are we not going to rely on petroleum imports? No, hold on, hold on. And what I'm trying to say is, if that's the case, LPG is a byproduct of the overall petroleum inputs that we are getting for multiple purposes. And a lot of LPG related, you know, petroleum distillation products are actually flared, y'know.. wasted because we don't have a market that you know, that that can really use it up by being bottled and sort of doing that. And lots of very careful calculations is has shown that if there was one really cost benefit, producing use for petroleum products, it would be the LPG in the household sector. If some of that transportation efficiencies, some of those power plant efficiencies could easily be rearranged, we would be able to supply pretty much all our people. Yeah, we would have a net import increase there is no question about it, but that net input increased costs would be more than more than y'know.. offset by the health costs averted by the use of LPG at scale in the near term. The second important thing is, you know, be they are the whole choice of energy, household energy is very, very, you know, influenced by social and cultural preferences for cooking habits. And in turn time, and again, every energy user survey in India has now revealed that, if you look at even the remotest part of Bihar remotest part of Uttaranchal, if people can adopt a technology read delete for all types of cuisines or types of family sizes all types of, you know, what they call preferences of, you know, what might be what they are working woman, farmer, you know, small scale industry operator, an uneducated person and educated person, LPG comes across as something that people will do today. If only they had that extra 450 rupees, not, you know, the same, including your mother in law and my, you know, mother who are aged and who think about money, even today in their age, despite us children being and not asking them not to worry, is that extra money that they would have on their table... If that's the cost that government has to invest to affect this, you know, overnight, behavioral transition or behavioral transitions are very difficult to accomplish. You can argue anything you want, you have to use this, you have to use this. So you can imagine electricity and solar, right, you know, there are other uses for electricity that we have still not solved. For lighting for other rural electrification purposes. So by the time solar comes to the household sector in terms of devices and preference, that's at least another 25 years. So even if you that's probably at least another 50 years, in my opinion, but you know, do we want to wait that long? It's a again, and most important point, is one of gender equity. Go and ask any woman what would be the biggest benefit of switching to LPG? *(hindi) Work happens fast*. It's as simple as that time poverty of women refuses to figure out in any mathematical econometric model, everybody takes woman's time for granted. What is their... if whether forget about fuel collection, even if fuel were processed and made available, it is not a switch on switch off technology in solid fuels. So I'm talking about even the comparison to electricity, all of that to match up to LPG is going to take time. So in the you know, instead of leapfrogging from solid fuels to electricity, which is still uncertain, let's try to leapfrog from solid fuels to LPG. We can deliver LPG at scale, we can affect behavioral transition at scale, we can affect health benefits at scale, we can address time poverty at scale, but we cannot easily address the cost of petroleum inputs. Can we be creative in getting this benefit for the next 20 years, and then we will be able to perhaps solar technology or perhaps other kinds of you know clean energy solutions are going to be available and then we will looking we will look at the next leap frog in a step ahead. But leap frogging on two uncertain grounds for behavioral transition is not something that we are ready to recommend now.

**INTERVIEWER** 34:55

Right. Basically, the question also came from because what you said actually answers that doubt in my head because I was talking to both people from XXXX who are working in the energy sector and people from West Bengal who are working in the energy sector in the especially in the electricity distribution sector. And both of them, because these are two states where there is a very, very high level of grid connectivity, or renewable energy connectivity, I mean, where the grid doesn't reach they have and but both these states kind of boast off almost 95% to 96% of electricity connection to the household level. And these two states actually have state programs by which they're distributing induction cookers, induction stoves, to households to make that transition. But the other side of it is also this fascination of wood *chullahs* for cuisine. You know, I don't know whether you have seen the movie The Great Indian Kitchen, it's a Malayalam movie, I think you should watch it, it kind of talks about the kitchen a lot and the pollution because here is this elaborate big house where the men always expect their food to be cooked in wood *chullahs*, because the taste is different than you know, stuff like that is something as a practicing architects in XXXX I have seen that, even in households even where they have the wealth, and they have an LPG connection, and they're using the LPG connection, but they have the wood *chullahs* for certain food because like *payasam* some can only be cooked on a wood *chullah* for proper taste, you know, stuff like that. So that that kind of social behavioral change also might be quite difficult to achieve right, despite the economic challenges not being there.

**RESPONDENT** 36:36

yeah, that that is actually a myth, you know, that accounts for a very small fraction of the overall exposures, you know, what I mean? Yes, you ask any one of us we would love to have a wood fire, you know, pizza or wood fired *payasam* or wood fired, you know *rasam* or you know, *bhaji* or whatever, you know, all of that is there. But that is not everyday life for most of us came, that's not to say that you know, we all engage in some risky behaviors at some point right in our life, okay, no question okay. Because there is a certainty value there is a pleasure value for us, despite the risk in whether it is greasy food or alcohol or, you know, something else more risky, but, you know, we say that, you know, it's not as though we say people should not eat, you know, oily fried food at all right, we say that, you know, avoid it most of the time, right, and therefore, reduce the amount of calories that come out of greasy food, you know, or, you know, oil, other kinds of things. So, similarly, it's not as though you know, using a wood *chullah* for an occasional celebration for an occasional you know, family get together for certain, you know, religious occasions or, you know, those are not things that we are recommending, what we are recommending is an everyday lifestyle choice, that can be enormously facilitated through energy efficiencies, that clean technologies such as LPG can provide everyday we are not pie making *payasam* right most of in South India, most of the time, they are looking at just, you know, keeping congee or some rice or some, or for that matter, you know, making *chappati* is in the, in North India, for that matter, which are all much, you know, more easily done. And if you're looking at, okay, even if there is a element of social preferences that are driven by a gender differences in perception of what the health benefits are, once we have the evidence, you know, it's not uncommon actually, even in our maternal and child health clinics, we have many men who come and ask, you know, my wife is pregnant. So what do you think I should do? So for certain vulnerable periods, even they are willing to do this, and there are many young men who are willing to change there are many young women you know, you must have you know, the I don't I forget the name of the other movie, or we were looking at even if you don't give me a clean washroom, I am not getting married kind of thing, you know?

**INTERVIEWER** 39:34

Yeah, Toilet.

**RESPONDENT** 39:34

I don't remember the name of the movie. But what I'm saying is that's an essential women's awareness, a piece of work that if we can educate young girls, to ask for not just, you know, personal effects, but if we have the evidence, and we have to sort of say, these are preferences that we must work on in terms of an awareness, but the evidence for health is, you know, unequivocal in the sense you know, it's like we have the so the only question is, should LPG be the only choice we're not saying LPG should be the only choice, but LPG is the best available pragmatic choice. And you know, we should not... and recognize that, you know, despite all of this, more than health, quality of life, other kinds of ...time poverty, things are going to be solved in the near term. And then it becomes a much easier thing to bring in another technology that provides similar benefits, but is much more clean from climate point of view, from an renewability point of view, from an economics point of view, it is much easier to work through these things, you know, in within the society, once an acceptability, critical mass of acceptability for clean technologies, is you know, so now every rural woman knows right whether or not she's able to do that *(hindi) Children should be given boiled water*... that they know whether or not they will at least try to do it okay at least when the kid is sick, they will try to do that that awareness is there, you have to be clean. So, this has to be ingrained in them you know, what they do in order to solve sometimes they're very creative, they will come up with their own problem you know, so, if they can use the induction cooker as long as well as LPG to you know, the grid electricity is cheaper than induction or LPG, they will have an LPG cylinder an induction cooker like you and I do. We use induction cooker depending on you know, if the there are efficiencies in the electricity grid structure brought about by economies of scale, more people are using it, we might switch and our LPG supplies can be made available to the rural areas. Are we going to every every rural household with a device that is capable of cooking all the cuisines that the rural masses LPT they're already in that stage know what I mean? And we are tested this across. So the myth of... men actually prefer this, you know, there are many focus group discussions, women are ready to say, you know, at least for this, half of them don't even know how the meal is cooked, they are thinking that they should women should cook this much as long as they have a hot hot meal on their table, which tastes good, they are not bothered. But why, you know, why come up with a compulsion like this? So we have to work on this from a social advocacy point of view.

**INTERVIEWER** 42:31

Right, right. In terms of the policy context of your work, ma'am, what do you think are any supportive issues and developments or challenges that you see for the kind of work that you are doing.

**RESPONDENT** 42:45

Yeah, actually, from a policy point of view, one of the biggest opportunities we have and the mechanism that we are hoping to draw support from is the, you know, the National Clean Air Program, in which abatement of indoor air pollution from the household sector is identified as a national priority. So, this is primarily thought of as something that has to be targeted for reducing air pollution amongst rural communities. But we are wanting to pitch this as the primary you know, mechanism through which ambient air quality standards can be achieved in an air share, you know what I mean? So, for example, if you have one city and a neighborhood of villages and you know clusters that are surrounding it, all of whose air quality is impacted by household fuel combustion of solid fuels, then if we can take that household fuels alone, can we look at benefits for the entire air share? So, it could be Delhi NCR, it could be Mumbai greater Mo, no Greater Mumbai Corporation it could be Greater Chennai Metropolitan Area, it could be greater it may not be you know, if the big cities are bigger problem to solve, it could be some other you know, it could be Lucknow, it could be Kanpur or it could be you know, places where just by reducing the household fuel emissions, how much can we benefit the ambient air quality? If that because ambient air quality standards are much more advanced in terms of being able to be enforced. You can't enforce the households saying that you should not burn dung or you know, wood for cooking your food that's not regulated right. If the PMUY program can find no money to increase the number of free refills like in COVID they provided three refills and then they increased refills to six refills right. This was an experiment. So we are trying to look at if that experiment can be rolled out in a few more states even after COVID and if we actually see you know, because *(hindi) what happened in Covid* ... at the same time that they gave free LPG cylinders, pretty much all other economic activity had stopped. So, we could not detect the signal very well, whether you know, we will be able to achieve the same benefits even in the presence of other economic activity, Already the air pollution was less... less Yeah, so, if we can actually roll this out in some, you know, few test grounds then what we could do is you know, piggyback the Clean Energy Initiative of Government of India PMUY does want to increase not only access but also LPG refills right. So, there is a huge MOPNG has a huge you know, Ban to not only increase access to LPG, but also increase LPG use you know, so, that distributors can become more economically you know, self sustaining because the volume of LPG use would be high even in remote areas. So, people would be willing to take up distributorships in in difficult areas, because, you know, if the volume is not high, the distributor is not very keen on taking up an agency there right... things like that. So, that we can actually expand access to LPG as well as increase the use of LPG and provide benefits to not only your own village or your groups of village, but to a city that is reeling from emissions throughout all the villages. This would be a low hanging fruit, this is a major support mechanism and then we can look at if we can scale it up for vulnerable windows of time okay to do that, but the challenge, as you rightly noted, is still we are still not able to pitch this as a primary air quality action. It is talked about, but it is not listed amongst the air quality intervention strategies of Central Pollution Control Board. They feel like you know *(hindi) this is work of another ministry*... you know, this is not.. if we get the benefit for air quality, fine, we will acknowledge that, but this is not something where we have been able to provide the science, I think so we, as researchers, we are really wanting to demonstrate that this is important for the formal ambient air quality regulatory mechanisms. To pick this up so that they can... it's two birds in one stone, rural and urban indoor, and outdoor all in one go...

**INTERVIEWER** 47:45

to make to make. It's not just the woman in the kitchen's problem, but everybody's problem...

**RESPONDENT** 47:51

Everybody's problem. Everybody gets to benefit if you take care of your woman in the household, right?

**INTERVIEWER** 48:00

Yeah, yeah.

**RESPONDENT** 48:02

For more reasons than one... not just for cooking fuel (laughs)

**INTERVIEWER** 48:09

Sadly forgotten.

Part 2

What does equitable energy access mean to you?

**RESPONDENT** 48:23

Equitable energy access means that the poorest, the most vulnerable, and, you know, the least educated sister of mine who lives somewhere else gets to enjoy the same quality of life that I do...for her, or they know their family's everyday needs. I'm not talking about luxury. I'm not talking about being able to go and eat out and cook fancy meals. I have enough energy to educate. In order to do my everyday chores efficiently. I have enough energy to educate my children feed my children efficiently. You know, I have enough energy or enough energy or good sources of energy that allows me to take care of the health of my family. But that's not something that everybody can get access to, readily, without, you know, the intervention of the government. This is not a market phenomenon, it should not be driven by markets, this is a public health good and therefore, we have to have policies so that equity means equity that you have the right you should have the right to that equity should not just Talk about equity, you must be able to demand for that equity. You know, and you have to raise the awareness to a point where they are able to demand for equity, at least, if you demand, there is half a chance that the supply will rise to the demand. So the voice of the people who don't know what energy equity means needs to be strengthened. They must know that their health, their family's health is at risk.

**INTERVIEWER** 51:03

Right. And so within this agenda, I mean, basically, you're talking about it from the gender equity angle? Or if I ask you, what does gender equity in energy access means? would your answer be different or larger, or some other issues?

**RESPONDENT** 51:23

Say that again, I missed a little bit of that.

**INTERVIEWER** 51:26

So I've asked you first about equitable energy access. My next question is about gender equity within energy access, would your answers be the same? Or do you have a different perception...

**RESPONDENT** 51:39

the most of what I said holds good for gender equity to that, you know, the gender equity that I was talking about is what is gender IQ in or what is available for the urban educated woman should be available for the rural, uneducated or poor woman to that's one thing, but what is different about that is as far as energy equity is concerned, but when you come to gender equity, right, you know, you look at if, if, let's just look at the cell phone analogy, right? Would a man of the household be able to the would they be happy if they said, you know, *(hindi) Cellphones will not work..* go back to your landline? Okay, *(hindi) now your bike wont work* go back to your cycle. Right? They leapfrog very quickly. Yeah, because it is a technology that they love. Right? But if it's not something that they are involved in, because they don't cook, most men don't. So why should the woman be cooking with a *chullah*? Right? So this gender equity is huge. So not all household expenditure decisions impact both the members of the family equally. Some tasks that are only handled by women, there is a huge issue there. We are less willing to leapfrog on things that do not impact both of them equally. But we are very willing to leapfrog on things that matter to one or the other the I don't think there has been an instance where a woman's preference is accorded you know, more value than men, I would love to know of such examples where they exist, but many examples where preferences of men are given overwhelming priority over the men especially if they are uneducated and poor. So, gender equity means that technological or economic benefits must be uniform across preferences of men and women including in energy. So energy preferences should not be thrust upon you know, poor energy preferences should not be thrust upon women.

**INTERVIEWER** 54:12

So Ma'am, in your work, the data collect the data collection process, so if you could just explain it to me, especially in terms of, you know, how do you map diversity in access? How do you how do you map gender diversity in your energy access, that kind of thing and if there are other criteria of diversity that you are looking at within your data collection in your research?

**RESPONDENT** 54:37

Yeah, the first thing is, you know, be recognized early on, you know, we first started getting into the field and just looking at what is a kitchen, a rural kitchen look like? You know, and what does the activity of people surrounding a rural household look like? In, in in a representative set of households in a community right. So, when you start walking through a community, you quickly realize you know, there is such a diversity of how the kitchens are configured, you know in relation to the stove even if you assume all I know solid fuels and you know between communities that are located in the heart of the community very close to the city, main road, you know, there are some you know, communities that for various other kinds of you know, socio social reasons are not sited within the heart of the community, they are often located at the periphery of the habitation and some are located in very inaccessible areas, some have access to greenery, some do not have access to greenery. So, these are all and you know, and most importantly, some are located in in areas where the, the, the, the temperature fluctuations outdoors is not much, especially the southern states and some are located in areas where the temperature fluctuation is So, much that they need the fuel not only for cooking, but also heating you know, animal feed, bathing water and many other purposes and family size is a very important variable as well, there are numerous variables that can affect exposures. So, you can actually have you know, solid fuels producing very small amount of exposures in Tamil Nadu compared to Uttaranchal for example, or for that matter, you know, areas of Uttar Pradesh or in the Indo Gangetic plain where you have emissions, very high population densities, very large family sizes, huge temperature induced inversions, you know, and, you know, social restrictions on women's movements that are influencing where they cook, when they cook and how long they cook, and things like that. So, our methods, by by no means has captured the entire exposure heterogeneity of India, but we know that now, if you use biomass, no matter how least polluting the setting is still it is way, way, way, way, way above health based standards, it can only get worse with anything else. And similarly, if you use clean fuels, LPG, as long as you have exclusive LPG use at your household without any contributions from outside, you have to work on how to minimize contributions from outside including people, other people using the *chullah*, but if you were to use it only, you know, in your household, if there are no other contributions, regardless of whichever configuration, whichever family size, whichever geography whichever this thing, the you know, as a clean fuel choice, you know, similar things have been done even with electricity in in a small scale, but any clean fuel that beats who technology guidelines does provide, so clean is clean, dirty is dirty. So therefore, biomass, that's the first step our work has established. So, therefore, the question is how to enable the clean stately, right, so you can just use biomass fuel, and LPG, you know, what we in what we call as stacking, right and you can stack things, if you stack clean, and then you will get only dirty even if there's a little bit of dirty in your clean, the whole clean will become dirty. So, the goal is to make sure that you minimize the stacking to a point where clean stays clean, dirty stays dirty, and then we can slowly try to you know, so, therefore, we must try to get critical, you know, masses of clean transitions happening that's where our work has been in terms of profiling the diversity and we have looked at you know, measuring, modeling, you know, interviewing, walking, observing geocoding, mapping, to understand this diversity of situations wherein you can really profile access, you can provide a profile community preferences. So, if woman in Tamil Nadu say this compared to women in West Bengal say this compared to women in Gujarat say this, where are the harmonious decisions we can make? Where are things really, really different where you can't don't let's not try to come up and say, be overly naive and say, yeah, this ought to work because it worked in Tamil Nadu, why shouldn't it work in West Bengal, you shouldn't be naive. So every element of not being naive at the same time, we shouldn't be sort of stereotypical in terms of saying, Yeah, we've assessed it in one, therefore, this must be the case... that often happens. So that's been the nature of our work so that we can profile... well, and at the same time, we can keep on as researchers, we can keep on spending a lifetime assessing, assessing, assessing, you have to act, right, so that's the goal there. Can we act? And? And when, and how.

**INTERVIEWER** 1:00:47

So this diversity that you've been mapping? You talked about community, regional diversity is also how so many factors effect? Have you also seen it in terms of like age group? diversity? I think you were talking about something about young people versus Yeah,

**RESPONDENT** 1:01:04

it's a it's a very dramatic transition. It's just this difference between us and our kids, when it comes to social media, right? They for them, you know, who cares about, you know, *Doordarshan*, no chance, who cares about cable TV? No chance, right? You know, if you don't have Amazon Prime, then you're gone. Right? It's as simple as that it's the same divide in the rural women. Right, you know, it's like, they, they don't want to be fussing around with *chullahs*. They don't want to be fussing around with this thing. But it's not uniform, right? It's not in all states, obviously, you know, we are talking about social media, as though every kid is wanting only Netflix movies, right? It's not that there are still people that our kids would be gladly watching anything, anywhere. But nevertheless, you will notice even the lowest socioeconomic status kid, even the kid who is you know, sort of in the roadways begging, even they're very much aware about what the so the awareness is very much there. And there is a lot of diversity, there is a sea change in preferences between what younger age group women want, regardless of their economic status, and regardless of their education status, mainly because of the advancement in communication technology, because of the internet. People learn people know, and therefore, they want to know, the aspirational demands of women is becoming very much influenced by the age. So the more, you know, the children, the young women think it is okay to aspire. They don't think it is not

**INTERVIEWER** 1:02:47

the way Ujjwala messaging has happened so these were also new things..

**RESPONDENT** 1:02:52

Yeah! So it is targeted, right? It is say it says that, you know, for the first time woman's dignity mattered, right? And so, you know, and your health mattered, and your time mattered, your the way you your household looks, matters, you know, so all of these are very, very normal way of targeting, behavioral transition. So if the woman or a young man gets married to a young ... young wife in the young wife puts this as a demand for their message, their impression is going to be changed for many things, including in what's basically a clean, so let me also, you know, cap it, I need to be wrapping this soon. But it's it's the overall household environmental factors, right? It should not be forgotten. We want to know a clean household, you know, so we have many (hind) programs of the Government of India, whether it's the Pradhan Mantri Awas Yojana, we have Swachh Bharat, we have, you know, PMUY is not pitched as the Swachh well we have Swachh Indhan maybe you know, but we have to sort of really pitch this as the clean household, you know, package that takes care of all kinds of determinants of health within the household, whether they are environmental, whether they are lifestyle, or whether they are social, but all determinants of health, including these environment and especially this clean energy because clean energy once you have LPG, the woman is far more likely to boil water for her young child because it doesn't require you know, mooting up the fire, right and a sick child. So you might avert so many cases of neonatal mortality, so many cases of pneumonia, so many cases of childhood, you know, diarrhea or jaundice or other kinds of things because you are able to boil water with a clean energy. So, it has to be looked at holistically at something that so that how holistic message has to get To the young women who run the household *(hindi) if we do it in one, and not do it in another*, if it is not done, it is not going to benefit,

**INTERVIEWER** 1:05:08

Ma'am, energy infrastructure- other than cooking fuels, have you worked on anything else?

**RESPONDENT** 1:05:15

And not really not really, you know, we have some we have worked a little bit on cooking fuels outside of the household sector, you know, including in the schools and, you know, sort of the noon meal scheme where, you know, people, so it's not only about other public health programs, not just cooking as... anything on livelihoods? No, I don't have much experience in terms of what their gains are for, you know, how alternative livelihoods or even supply chain livelihoods could be created out of, you know, clean energy transitions, per se, I know that many of my colleagues are working on this, but I personally don't have experience or exposure...

**INTERVIEWER** 1:06:01

So outside your specific work, what in your view, like when you see that, like you were talking about all these policies, which are being done by the government, or there are a lot of new energy infrastructure and technologies which are being planned, and which are being implemented across India? In your view, are there any differences in how men benefit out of it versus women?

**RESPONDENT** 1:06:32

I don't think so. I think men and women stand to benefit equally. But sometimes, you know, men view.... things that are perceived as only benefiting women are not taken up very well. That's where the divide is. That's where, you know, household funerals differ from other kinds of energy benefits, lighting benefits, you know, it's very palpable, right, you know, but the lighting benefits for the, for the young child, who's able to read better and able to perform better in school is not perceived as a big tangible for the men of the house, but they know there are some differences like this, but people don't understand it, and the benefits are equal, but the perception about benefits, and the quantification of the benefits is far from complete. And the perception about benefits is very polarized, So to say...

**INTERVIEWER** 1:07:27

what I mean is like, when it gets implemented, like if you're talking about electrification itself, like one of the things that we were, that in during this research that I was finding out is like, when community level infrastructure is being electrified, what is being electrified, first priority are the office, the project offices, Ranger, obviously, all occupied by men, then the only much later are you talking about streets getting electrified in rural areas, which have equal impact for men and women, and maybe even more for women... Because there is a safety angle, right. And I only much later do they talk about pumping stations of water, which where women are..., you know, that you know, so that's what I was talking about, mainly.

**RESPONDENT** 1:08:35

We, you know, we need to sort of really look at the, the co-benefits for these things, you electrify a village, you're much better off trying to electrify the offices, the streets, the the households in this case, you know, all at one go. So, you know, often when you do a piecemeal you know, assessment of sectors that are primarily perceived to benefit men versus women, you lose up, you lose out because, you know, the sustainability of those programs, you know, becomes difficult to, to map out. But these co-benefits if they can be considered early on, then it makes them much more persuasive in what do you call case for rollout for the for the initiative, per se, right. You know, if you're looking at electrification for Panchayat officers, you know, why not electrify the *Anganwadis*, why not electrify the schools? Why not, You know, solar technology may not be applicable for cooking at the household but it can be used for providing hot water you know running hot water for the *Anganwadis* or the *Balawadis* you know running in cold areas, you know, running you know, even for that matter pumping water for the school toilets, you know, it would increase productivity of the school system, it would make school, school attendance would increase right you know, if there is electricity anywhere, and then suddenly you don't have to worry about having electricity available in the home because children are.. nobody's around in the home. So, if offices can be places that people prefer to spend their time because there is electricity, schools can be places where this thing and if community centers can be places so you can target yourself by all these benefits that you can get. So, cool benefits would be the way to go.

**INTERVIEWER** 1:10:52

And in decision making processes both at a household level community level and even at policymaking structures, how do you see gender participation in these in decision making processes?

**RESPONDENT** 1:11:05

At a policy level? You mean at the policy level?

**INTERVIEWER** 1:11:11

All the three levels...

**RESPONDENT** 1:11:13

Yeah, I think the best decision making processes at the more organized sector you know, fortunately in India, we are very blessed you know, it is equal you know, wherever there are science wherever there is capacities, if women and men are consulted, you know, I have not seen any differences in our opinions being held in organized educated forums, especially at the policy level or for that matter, even at the lower level, you know, in terms of institution wise interactions or even community level interactions. At the household level, especially in the rural sector, it's a very different ballgame. But all other tiers, I have not seen any difficulties in in women's participation in the process, whether it is at the at the institutional level and even at the community Panchayat level, there has been enough.... it may not be uniform across all blocks or all districts and all states, but you know there is a huge precedence for these things being accomplished the decision making process decision making at all levels, except the rural household level, where the gender disparities are still tremendous, I think you know, outside the house, the voices much easier.

**INTERVIEWER** 1:12:40

Yeah, and between urban and rural context, do you see a difference in gender equity and energy access?

**RESPONDENT** 1:12:47

Um, I would definitely Yeah, definitely, there is a gender equity deficit in the rural areas that is far more pronounced than the urban areas, but it is not. So the urban areas is totally insulated from the energy access, it is lot more subtle. So, you know, maybe in the household fuel or the household cooking sector, the differentials are not so apparent for the urban versus the rural mean, for the urban men versus urban women, because you know, that clean fuel access is guaranteed anyway. But in terms of other energy access, you know, so if you're looking at the household being, you know, there are two air conditioned rooms, you know, who gets to sleep in the air conditioned room or who gets to study in the air conditioned room? Or which room tries .... When do you operate the AC versus, you know, when do you not talk? Things like that, you know, so general household energy equities, there are some subtle differences, you know, in terms of are women's spaces, less likely to see more things like that, but they are far more subtle. In the urban areas, but much more noticeable in the rural areas. I would need a hard stop in another, you know, three minutes.

Part 3

**INTERVIEWER** 1:14:17

Oh, okay. Oh, ma’am, quickly, then. A couple of things. One is do you think there are policy gaps around women's access to energy.

**RESPONDENT** 1:14:33

Ah, well, there are a To me, it's like you know, nothing is preventing in a policy level, you know, so that there are policy gaps in the sense of, you know, the current policy is nondiscriminatory, of course, but even within the current policy, there are some challenges women face in being able to get that policy work for them, those roadblocks for implementation of available policy must be closed. The existing policy....

**INTERVIEWER** 1:15:10

Can you give an example?

**RESPONDENT** 1:15:11

Yeah, so even, for example, you know, if the PMUY access, for example is given in the name of a woman, right, you know, the account is created in the form of form, and the connection is given in the car in terms of the woman, but you know, so for example, you know, but if there is no distributor anywhere nearby, then the woman finds it very difficult, you know, the guy will say, okay, you come and take the cylinder from, you know, from the, from the, from the village, you know, periphery woman can't, you know, do that lifting. So, she will wait for two weeks without a refill only because the man of the household is not available to ferry that and the distributor is not very, you know, able to sort of really promise the refill delivery....

**INTERVIEWER** 1:15:58

Last mile connectivity

**RESPONDENT** 1:15:59

the last mile thing. So, these are just one some subtle examples, the policy, you know, allows you to, to utilize that. But there are many more, you know, for example, the woman being able to go to the bank and create an *Adhaar* account, or *Adhaar* linked bank account, she's often dependent on the male person who has to take her to create that account. So a lot of times, you know, the actually, the PMUY program does have an officer coming and visiting the household. But still, the woman is not literate enough to actually create the bank account. So it's actually the man creating the account in the name of the woman in her household. So even though the woman's account is created in her name, *(hindi) what subsidy refund is coming*, she is not aware. She doesn't have access to that money, you know what I mean? To do that, so the fact that you know, so those kinds of things have to be... that awareness has to be raised.

**INTERVIEWER** 1:16:54

So that also becomes a social policy, like education and awareness, for women. Yeah, so my last question, no, imagining no policy, financial constraint for a moment, what in your view would be the best practice for achieving gender equity in energy?

**RESPONDENT** 1:17:16

Then I think, no, imagining no policy...

**INTERVIEWER** 1:17:21

no policy or financial constraints.

**RESPONDENT** 1:17:23

Right. No policy, no financial constraints? Yeah, well, you know, no policies, okay. But financial constraints is a little bit, you know, well, if you gave me, you know, a million dollars, what would I do with it, you know, to ensure, you know, so no financial constraints, as in, you know, people are, is there somebody willing to shower, a huge donation on this particular issue is a different matter. But I think, you know, we really need to invest in women's education. Education is key, I don't think anything else has the power to transform, like, education. So if there are, if all the money could just be put on educating rural women, young women, the next generation, and education be informed by the science of energy, energy considerations should be part of this education early on, because energy access is going to determine the future of this planet, sustainable energies, energy use is going to be key to sustaining the future of our population. And it goes beyond the household sector, you know, we work a lot within the energy space on the urban you know, non household sector, so to say, you know, there is huge amounts of lifestyles that we can stand to gain. And that knowledge that the energy sector has gained, has to be more formally introduced into the thought process of our educational systems, specifically targeted at women, because, you know, women tend to get left behind on many aspects of education. But if it's introduced early on, I think women both aspects, energy equity, and gender equity can be accomplished at the same goal by really taking enough efforts to transfer the knowledge and the science of, of efficient energy sustainable energies into our education system.

**INTERVIEWER** 1:19:38

And in your work, ma'am, how

**RESPONDENT** 1:19:41

I have to go now. Yeah.

**INTERVIEWER** 1:19:45

This in your work, how are you addressing this the education part? are you addressing it? In your work?

**RESPONDENT** 1:19:53

Not in any tangible way. You know, we are ....we usually are. attract students who are very well educated....

**INTERVIEWER** 1:20:04

Not general awareness.

Part 5: Concluding

So is there anything in this topic you felt we should focus further on? and any other person I should talk to? If you would...

**RESPONDENT** 1:20:16

I would suggest if you can, I don't know if you have had from XXXX, have you had the contact of...? XXXX. She works for XXXX. But she's a former colleague of XXXX. Please get her contact for Uma. I'm also happy to pass you on Contact Uma. She's worked in this space for a very long time.

**INTERVIEWER** 1:20:36

If you can send me her contact, that will be really good.

**RESPONDENT** 1:20:39

Sure.

**INTERVIEWER** 1:20:39

Okay, and if there are any follow up questions, I can probably email you or something, right? All right. Thank you so much, ma'am. Thanks. A lot.

**RESPONDENT** 1:20:47

Yeah. Okay. Thank you. Bye Bye.

**INTERVIEWER** 1:20:50

Bye.