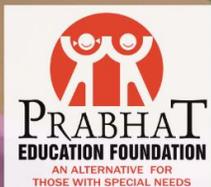


What does energy access look like when lived at the intersection of disability, gender, class, and care?

Energy, Disability, and Everyday Life in Ahmedabad

A MECS Report



May 2025

Ahmedabad, Gujarat, India

© Shaheen Parveen

Access to energy for people with disabilities in Ahmedabad City, Gujarat, India

About MECS Programme:

Modern Energy Cooking Services (MECS) Programme is an eight-year research programme funded by UK Aid (FCDO). We are a geographically diverse, multicultural and transdisciplinary team working in close partnership with NGOs, governments, private sector, academia and research institutes, policy representatives and communities in 16 countries of interest to accelerate a transition from biomass to genuinely 'clean' cooking.

In seeking to spark a new approach to clean cooking, the MECS programme researches the socio-economic realities of a transition from polluting fuels to a range of modern fuels. Whilst the research covers several clean fuels, the evidence is pointing to the viability, cost effectiveness, and user satisfaction that energy efficient electric cooking devices provide. Significant progress has been made in access to electricity in the last decade, but these gains are sometimes disconnected from the enduring problem of clean cooking. By integrating modern energy cooking services into the planning for electricity access, quality, reliability and sustainability, MECS hopes to leverage investment in renewable energies (both grid and off-grid) to address the clean cooking challenge.

'This material has been funded by UKaid from the UK government and is implemented by the Foreign, Commonwealth and Development Office; however, the views expressed do not necessarily reflect the UK government's official policies.'

Prepared By

Ms. Pramila Silakari, Ms. Krishna Keshvani, Ms. Katha Bhatt (Prabhat Education Foundation) and Dr. Amita Bhakta (Independent Researcher, UK)

Acknowledgements

This study is a part (sub-project) of the Modern Energy Cooking Services Programme, funded by UKAid from the UK Government and carried out by Loughborough University. Our heartfelt thanks go to the participants: the people with disabilities and caregivers from different parts of Ahmedabad at the heart of the research and the professionals from different sectors who gave their insights. We also are truly thankful to the Prabhat Education Foundation team for their tremendous support through the process: Keshav Chatterjee, Punitaben, Kiranbhai Parmar and the wider Prabhat Education Foundation team.

We also thank Vinitaben Modi, Mittalben Joshi and Jagrutiben Joshi for their facilitation of the drawing workshops.

Contents

Acknowledgements 3

Executive Summary 9

Key Findings: 9

 Accessibility and Physical Barriers..... 9

 Energy Dependency and Vulnerability 9

 Economic Constraints and Coping Mechanisms 9

 Gender, Caregiving, and Invisible Labor 10

 Institutional Gaps and Policy Disconnects 10

 The Myth of Universal Electrification..... 10

 Grassroots Innovations 10

Recommendations: 10

 Policy & Institutional Reforms 11

 Grassroots & Community Interventions 11

 Gender-Responsive Measures 11

 Corporate (Disability-inclusive CSR programs) & Utility Engagement..... 11

 Awareness & Advocacy..... 12

Background and Introduction 12

 Context 12

 Aim..... 14

 Objectives..... 14

Study Setting and Methodology..... 14

 Study Setting: Ahmedabad City..... 14

 Participants 15

 Study Tools..... 16

 Sample Size..... 17

 Data Analysis 19

 Ethical Considerations..... 19

Results..... 20

 Summary of Sample Size by Distribution Across Methods 20

 Demographics: Persons with Disabilities 22

 Age..... 22

Gender	22
Type of Disability	23
Income Bracket and Household Data	23
Demographics: Caregivers	24
Age.....	25
Gender	25
Type of Disability Cared For.....	25
Income Bracket and Household Income Data	25
Demographics: Experts	26
Gender	26
Background/Expertise	26
A Blind Spot in the Development Sector: Access to Energy for People with Disabilities.....	26
Access to Electricity for People with Disabilities	28
Household Connections to Electricity	28
Access to Functional Electricity Meter.....	28
Affordability of Electricity	28
Payment Methods for Electricity.....	29
Infrastructural Factors in Access to Electricity	29
Electricity as a Facilitator in the Development of People with Disabilities	32
Institutional Energy Needs and Adaptive Solutions.....	33
Communication Barriers and Systemic Gaps in Deaf Accessibility.....	33
Untapped Potential of Renewable Energy Solutions.....	34
Access to Cooking Fuels for People with Disabilities.....	34
Cooking Fuels Used by Households with PWDs.....	34
Challenges in Obtaining Cooking Fuels.....	34
Awareness and Access to PMUY (Pradhan Mantri Ujjwala Yojana)	35
Impact of PMUY Support on Household Energy Use.....	35
Challenges Faced by PwDs in Using LPG.....	35
Experiences of Cooking for People with Disabilities	37
Role of Different Senses	37
Physical Challenges and Adaptations	39
Cooking Gujarati Cuisine.....	49

Emotional and Social Impacts.....	54
Cleaning	55
Assistive Devices and Energy Dependency.....	55
Feeling At Home: Use of Household Appliances	56
Socio-Cultural Dimensions of Energy, Cooking and Disability	58
Gender and Disability Intersections.....	59
Dynamics in the Home Environment.....	65
Disability-based Discrimination	66
Structural Inequities.....	67
Independence of PWDs	67
From the Classroom to the Kitchen: Education, Teaching and Learning.....	70
Traditional Kitchen Design, Cooking Techniques and Cuisine.....	74
Urban-Rural Cultural Divide	75
Socio-Economic Dimensions of Energy, Cooking and Disability-	76
Employment, Income, and the Myth of “Mercy”.....	77
The Kitchen as a Battleground: Safety vs. Autonomy	79
Aspirations: “Why Can’t the Kitchen Count Too?”	80
Design Justice: Who’s Included? Who’s Ignored?.....	80
Economic Dependence and Control	80
Class and Urban-Rural Economic Divides	81
Experiences of Caregivers in Meeting the Energy Needs of People with Disabilities	81
Gendered Roles in Caregiving.....	81
Normalizing Care	82
Cooking and Household Chores	82
Mobile Phones as Support.....	83
Managing Routines for People with Disabilities	84
Increased Dependency of People with Disabilities	84
Support of Family for Caregivers	85
Encouraging People with Disabilities to Learn Life Skills.....	87
Caregivers’ Health and Self-care.....	87
Urban Planning, Housing and Energy Infrastructure	87
Government, Community and Institutional Support Mechanisms.....	94

Absence of a Disability Lens in Energy Policy.....	94
Government Schemes: Patchy Reach and Low Awareness	94
Informal Community Coping vs. Institutional Apathy	94
Institutional Engagement: Sporadic, Risk-Averse, and Often Non-Inclusive	94
Lack of Cross-Sectoral Coordination.....	95
Unseen Needs: Bridging the Gender Gap in Energy Access.....	95
Small Wins, Big Gaps: The Quiet Fight for Inclusive Energy Access	96
Key Findings	97
Accessibility and Physical Barriers	97
Energy Dependency and Vulnerability	97
Economic Constraints and Coping Mechanisms	97
Gender, Caregiving, and Invisible Labor	97
Institutional Gaps and Policy Disconnects	97
The Myth of Universal Electrification.....	98
Grassroots Innovations	98
Recommendations.....	99
Policy & Institutional Reforms	99
Disability-Inclusive Energy & Urban Planning	99
Data & Accountability	99
Grassroots & Community Interventions	99
Affordable Assistive Technologies.....	99
Capacity Building	99
Gender-Responsive Measures	100
Corporate (Disability-inclusive CSR programs) & Utility Engagement.....	100
A Final Call: Energy Inclusion through Intersectional, Collaborative Design.....	100
Conclusion	100
Appendix Appendix A: Semi-structured interview questions for parents and caregivers	102
Appendix B: Semi-structured interview questions for People with Disabilities (PWDs).....	103
Appendix C: Semi-structured interview questions for professionals (1): Disabled people's organization staff.....	105
Appendix D: Semi-structured interview questions for professionals (2): government and institutional officials.....	109
Appendix E: PhotoVoice Guidelines for People with Disability.....	110

<i>Appendix F: Consent form for PhotoVoice: People with Disabilities</i>	111
<i>Appendix G: Overall Study Consent Form</i>	112
<i>Appendix H: Participant Information Sheet – PwDs</i>	113
<i>Appendix I: Participant Information Sheet – Professionals</i>	115
<i>Appendix J: Participant Information Sheet – Parents and Caregivers</i>	117
<i>Appendix K: Energy access survey multi-tier framework – Survey Form</i>	119
Bibliography	125

Executive Summary

This study, conducted collaboratively by Prabhat Education Foundation and Dr. Amita Bhakta (Independent Researcher), investigates the often-overlooked intersection of disability and energy access in the urban context of Ahmedabad, India. While national schemes such as Saubhagya and PMUY have significantly improved energy access across India, the specific needs and experiences of persons with disabilities (PwDs) remain invisible in policy and infrastructure planning.

The research involved 78 participants, including PwDs, their caregivers, community workers, and experts, to understand the multifaceted challenges they face in accessing electricity and cooking energy. Employing qualitative and participatory methods—including interviews, drawings, PhotoVoice, and storytelling—the study uncovers critical insights on infrastructural, economic, social, and institutional barriers to inclusive energy access.

Key Findings:

The study reveals intersectional challenges faced by persons with disabilities (PwDs) in low-income urban settings, highlighting systemic gaps in accessibility, energy equity, and policy implementation. The findings are organized thematically based on recurring patterns from interviews, participatory tools, and expert inputs.

Accessibility and Physical Barriers

- PwDs encounter **compounded inaccessibility** in housing and public infrastructure: narrow staircases, elevated switchboards, poorly lit shared toilets, and kitchens without adaptive designs, forcing unsafe practices like floor-level cooking.
- **Visually impaired individuals** lack tactile or audio cues on appliances, increasing reliance on hazardous alternatives (e.g., open flames).
- **Public facilities** (clinics, therapy centers, electricity offices) frequently lack ramps, elevators, or adequate lighting, excluding PwDs from essential services.

Energy Dependency and Vulnerability

- Households with PwDs have **higher energy needs** for cooling (fans), heating (heaters), assistive devices (wheelchair chargers), and health equipment (refrigerated medications).
- **Power instability** disrupts critical routines—children with battery-dependent aids face interruptions, while caregivers adjust meal prep, bathing, and therapy schedules around electricity availability.

Economic Constraints and Coping Mechanisms

- **Affordability** is a major barrier: families avoid simultaneous device usage to limit bills, resort to unsafe informal connections, or prioritize energy for health needs over other household uses.
- **Energy rationing** is common, with medical devices often deprioritized due to cost concerns.

Gender, Caregiving, and Invisible Labor

- **Female caregivers** (often mothers) shoulder disproportionate energy-related burdens—managing devices, adjusting routines, and sacrificing their own needs.
- **Women with disabilities** face **double exclusion**: restricted control over energy use and exclusion from household decisions. Elderly PwDs, particularly women, are further marginalized in energy usage.
- Cultural norms **force disabled women into unsafe cooking roles**, with visually impaired women enduring burn injuries and deaf individuals missing auditory safety alerts.

Institutional Gaps and Policy Disconnects

- **Awareness of energy schemes** (e.g., Saubhagya, PMUY) is low among PwDs, and application processes are complex therefore not accessed.
- **Policies lack disability-inclusive standards**: no mandates for accessible utility designs (e.g., meter height, tactile interfaces) or prioritized service for life-sustaining equipment.
- **Urban data systems** (Census, NSS, SECC) appears to lack capturing disability-specific energy needs, perpetuating planning blind spots.

The Myth of Universal Electrification

- While India claims **91% household electrification** (Saubhagya/PMUY), **physical connectivity does not guarantee functional access for PwDs**. They face **de facto exclusion despite de jure connectivity**:
 - **62%** of surveyed PwD households in Ahmedabad required caregiver assistance to operate switches/meters.
 - **45%** couldn't independently read bills or meter displays.

Electrification metrics ignore:

- Physical accessibility (e.g., unreachable meters, lack of tactile interfaces).
- Safety for sensory/mobility impairments.
- Affordability of sustaining medical devices.

Grassroots Innovations

- **Deaf communities** develop visual alert systems for appliances.
- **Wheelchair users** improvise floor-level cooking spaces.
- **Community networks** establish emergency energy-sharing systems.

Recommendations:

To address the systemic exclusion of persons with disabilities (PwDs) from functional energy access and inclusive urban infrastructure, the following multi-stakeholder recommendations are proposed:

Policy & Institutional Reforms

Disability-Inclusive Energy & Urban Planning

- **Revise electrification policies (Saubhagya, PMUY)** to include **accessibility audits**—mandating tactile switches, audible meters, and reachable infrastructure.
- **Link energy subsidies** (e.g., free/subsidized units) to households with PwDs, prioritizing those with life-sustaining medical devices.
- **Amend building codes** to enforce universal design standards (ramps, lighting, kitchen adaptations) in both public utilities and low-income housing.

Data & Accountability

- **Integrate disability-disaggregated energy needs** into national surveys (NSS, Census, SECC) to inform planning.
- **Establish monitoring frameworks** to track functional (not just technical) energy access for PwDs.

Grassroots & Community Interventions

Affordable Assistive Technologies

- **Subsidize adaptive devices** (e.g., voice-controlled switches, non-slip cooking tools) through partnerships with disability NGOs.
- **Promote decentralized solar solutions** (e.g., battery backups for medical equipment) tailored to PwDs' needs.

Capacity Building

- **Train caregivers** on safe energy practices (e.g., fire hazards, backup management).
- **Peer-to-peer networks:** Scale grassroots innovations (e.g., visual alert systems) through community workshops.
- Train **energy utility staff, urban planners, and Anganwadi or ASHA workers** on disability-inclusive energy service delivery.
- Develop practical **toolkits for caregivers** on safe and energy-efficient routines for households with PwDs.
- Conduct **disability audits** in public electrification and infrastructure projects, using participatory metrics.

Gender-Responsive Measures

- **Targeted energy subsidies for women caregivers** to reduce financial strain.
- **Safe cooking initiatives:** Provide accessible cookstoves and burn-prevention training for visually impaired women.
- **Include PwDs (especially women) in energy decision-making** at household and local governance levels.

Corporate (Disability-inclusive CSR programs) & Utility Engagement

- Energy companies to fund accessible infrastructure (e.g., ramps in electricity offices, braille bills).

- Promote **low-cost, accessible cooking and lighting solutions**: tactile stoves, audio-activated switches, or solar standing fans.
- Encourage **product innovation** in assistive technologies—focusing on energy efficiency and context-specific design.
- Set up **charging stations** for assistive tech (e.g., wheelchairs, hearing aids) in community centers or health facilities.
- **Priority service guarantees**: Utilities to expedite repairs for households with PwDs dependent on medical devices.
- Retrofit public utilities and energy offices with **universal access features**: ramps, visual/audio counters, wider service areas, and accessible signage.
- Embed **gender-sensitive and age-inclusive design** in affordable housing and slum redevelopment, accounting for caregiving realities.

Awareness & Advocacy

- **National campaigns** to raise awareness of energy rights for PwDs, leveraging disability rights groups.
- **Policy advocacy**: Push for amendments to the **Rights of Persons with Disabilities Act (RPwD)** to include energy accessibility clauses.

Energy access for PwDs in Ahmedabad remains a paradox: widely available yet functionally exclusionary. This study underscores that solutions must move beyond technical connectivity to address dignity, safety, and intersectional marginalization. By centering PwDs’ lived experiences—especially women and caregivers—in policy and design, India can bridge the gap between SDG 7’s promise and reality. **Inclusive energy is not a privilege; it is a right.**

Background and Introduction

Context

Access to energy is a fundamental enabler of inclusive development, recognized globally through Sustainable Development Goal 7 (SDG 7), which aims to ensure universal access to affordable, reliable, sustainable, and modern energy by 2030. However, despite considerable global progress—91% of the world’s population now has access to electricity (IEA et al., 2024)—the energy needs and experiences of persons with disabilities (PwDs) remain largely invisible in policy and academic discourse.

Persons with disabilities, who comprise an estimated 16% of the global population (UN, 2018), often face compounded barriers in accessing energy. These include physical inaccessibility of infrastructure, lack of affordability, exclusion from subsidy schemes, and limited access to assistive technologies that depend on electricity. Moreover, global frameworks such as the UN Convention on the Rights of Persons with Disabilities (CRPD) do not explicitly include access to energy, resulting in a lack of attention to this issue in national and subnational reporting mechanisms.

In India, initiatives like the Pradhan Mantri Ujjwala Yojana (PMUY) and Saubhagya Scheme have significantly expanded household access to LPG and electricity, respectively. Yet, little empirical evidence exists regarding how people with disabilities experience or are excluded from these advances. According to NFHS-5 (2021), 4.52% of India’s population lives with some form of disability, with the highest rates reported in Gujarat and Maharashtra (Pattnaik et al., 2023). Locomotor impairments are the most common type, especially among children and the elderly—two groups with distinct energy-related needs that are rarely acknowledged.

Ahmedabad, Gujarat's largest city, presents a compelling case for urban energy inclusion. While it enjoys high rates of electrification and infrastructure coverage, approximately 13.1% of its population resides in low-income and slum settlements (CWAS, 2015), where informal electricity connections, lack of accessible cooking infrastructure, and high out-of-pocket energy expenses are common. In these contexts, persons with disabilities experience an intensified form of energy poverty—not due to a lack of grid supply, but due to systemic inaccessibility and socio-economic marginalization.

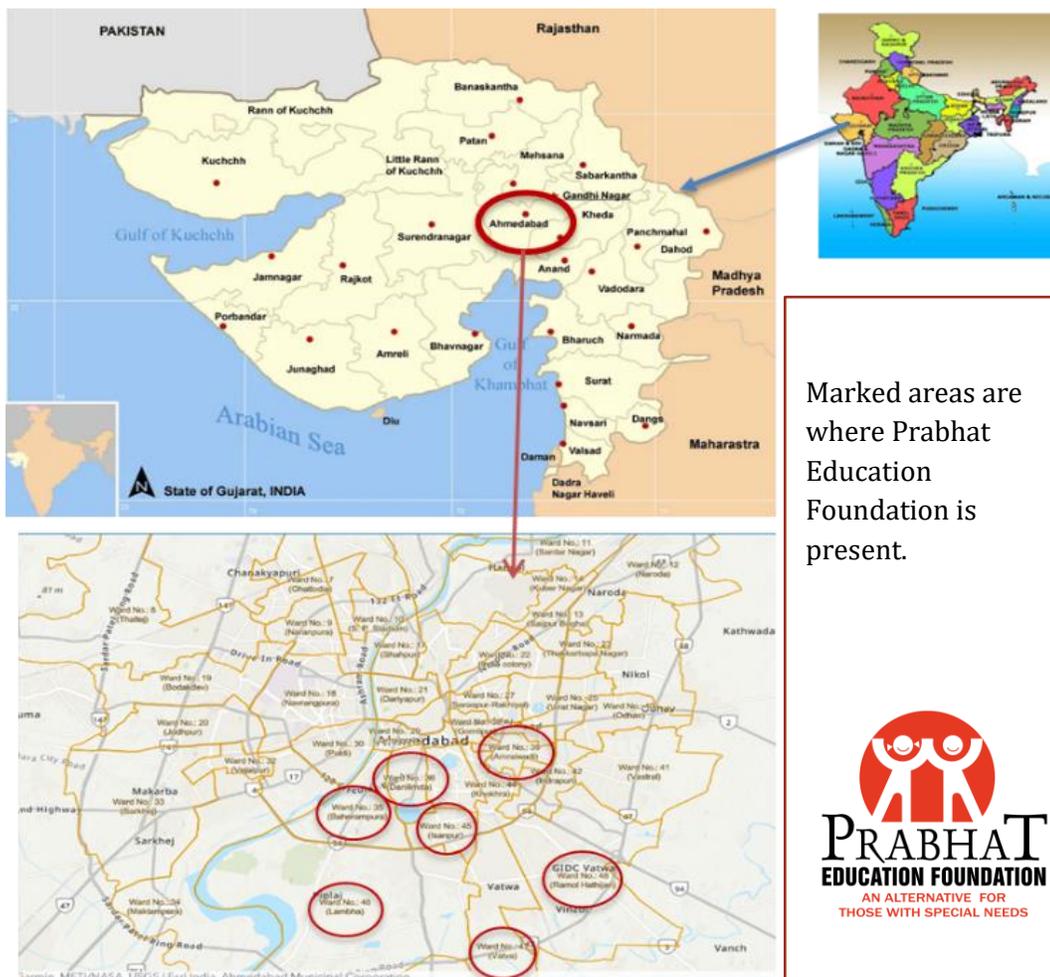


Figure 1: Map showing location of Ahmedabad and locations in which Prabhat Education Foundation is present

This research initiative, undertaken in collaboration with the Prabhat Education Foundation and supported by the MECS Programme at Loughborough University led by Dr. Amita Bhakta (Independent Researcher), aims to foreground these overlooked realities. By capturing lived experiences of energy access among PwDs and their caregivers in Ahmedabad's urban slums (low earning), middle income and high-income categories, the study seeks to generate disability-inclusive policy recommendations and advocacy pathways grounded in local evidence.

Aim

To document the experiences of people with different disabilities in accessing and using energy in Ahmedabad, India, and to provide evidence-based recommendations to meet their energy needs through inclusive policy and practice.

Objectives

1. **To assess the physical, economic, and social challenges** faced by persons with disabilities and their caregivers in accessing electricity and cooking fuel in urban low-income communities.
2. **To understand the experiences of cooking for persons with disabilities** from a physical, social, and emotional perspective.
3. **To examine how assistive and mobility devices** influence energy usage patterns and related vulnerabilities among PwDs.
4. **To explore the intersectional dimensions** of disability with gender, aging, and caregiving in shaping energy needs and access.
5. **To evaluate the role of government schemes and institutions** in enabling or hindering energy access for PwDs in urban settings.
6. **To develop participatory, visual, and narrative tools** (including surveys, interviews, and PhotoVoice) to document lived experiences and amplify the voices of PwDs.
7. **To recommend inclusive policy measures** that integrate disability into urban energy planning, service delivery, and innovation.

Study Setting and Methodology

Study Setting: Ahmedabad City

The research was conducted in **Ahmedabad**, the largest city in Gujarat and a rapidly growing urban center with a population exceeding 7.3 million (Census 2011, projected estimates 2023). While the city is well-connected to the national electricity grid, approximately **13.1% of its residents live in informal settlements or slums** (CWAS, 2015), where access to energy—both electricity and clean cooking fuel—remains shaped by informality, affordability, and inadequate infrastructure.

These low-income neighborhoods, marked by dense housing, shared utilities, and lack of accessible infrastructure, served as the primary field sites for this study. Given the local presence and established networks of **Prabhat Education Foundation**, the study focused on areas where

Prabhat actively works through its centers and community-based rehabilitation programs. These areas reflect a range of disability experiences and socio-economic conditions.

Ahmedabad presents a unique urban context for studying energy access for persons with disabilities (PwDs): while the overall electrification rate is high, the **lived experience of energy access remains unequal** due to factors such as:

- Inaccessible built environments
- Rising fuel costs
- Dependence on energy for operating assistive devices
- Limited awareness of existing government schemes

Participants

The study engaged a diverse set of participants to capture a multi-perspective understanding of energy access and use. Participants were selected based on inclusion criteria related to disability, caregiving responsibilities, and institutional relevance.

a) Persons with Disabilities (PwDs)

Adults (aged 18 and above) with exclusively focus on participants with visible disabilities, specifically visual impairment (VI), hearing impairment (HI), cerebral palsy (CP), and orthopedic disabilities (OD) were included. Participants were purposively sampled from Prabhat's networks and communities at Prabhat's intervention areas. This group reflected diversity in terms of age, gender, impairment type, and energy usage needs (e.g., use of assistive technology, dependence on lighting or ventilation, etc.).

b) Caregivers of Persons with Disabilities

Parents and primary caregivers of persons with disabilities were interviewed to explore how caregiving roles influence household energy usage and decision-making, particularly in contexts where the individual requires continuous care or assistive support.

c) Prabhat Staff

Team members at Prabhat—including special educators, community mobilisers, and program supervisors—provided organizational insights into how disability intersects with development and energy-related needs at the grassroots level.

d) Professionals and Institutional Stakeholders

Semi-structured interviews were also conducted with professionals from:

- Urban Management Centre (UMC), Ahmedabad
- BM Institute of Mental Health (BMI), Ahmedabad
- Composite Regional Centre (CRC) for Persons with Disability, Ahmedabad
- National Institute for Design (NID), Ahmedabad

- Health Care Foundation, Ahmedabad
- Other relevant NGOs and Institutes

These participants offered institutional viewpoints on energy access, inclusive infrastructure, socio-cultural challenges and policy gaps.

Study Tools

The data collection tools for this research were collaboratively designed by the study team. This co-design approach ensured that the tools are contextually relevant, sensitive to the lived experiences of people with disabilities, and aligned with the broader research objectives. A combination of participatory qualitative and quantitative methodologies was used to capture a rich and holistic understanding of access to energy among people with disabilities. The tools included:

- **Multi-Tier Framework (MTF) Survey:** A structured survey instrument was used to assess various dimensions of energy access. The survey incorporated and adapted the Multi-Tier Framework that allows for categorization of respondents' experiences across different levels of access, ranging from no access to full and reliable access. The survey was administered to people with disabilities and/or their households to generate quantitative data on patterns of energy availability, usage, affordability, and reliability.
- **Semi-Structured Interviews:** In-depth interviews were conducted with people with disabilities and their caregivers to explore their day-to-day experiences, energy-related challenges, coping mechanisms, and the impact of energy access (or lack thereof) on health, education, mobility, safety, and overall quality of life. These interviews followed a flexible guide to allow for probing and capturing personal narratives.
- **PhotoVoice:** This participatory visual method empowered selected individuals with disabilities to document their energy-related experiences through photography. People with disabilities were asked to think about five things that they enjoy or like about cooking and their energy use at home, and five things that they found more challenging. As part of the PhotoVoice process, participants were given a choice about:
 - Whether they wanted to take the photos themselves or direct us to do so.
 - Which moments and aspects of their daily lives they wanted to highlight.
 - Whether they wanted their faces to be visible in the published images.
 - Whether they wanted their own name to be attributed with the photos, which remain their copyright images, or a different one.

After the photos were taken, they were printed and presented to the participants.

Participants were then asked to give a caption for each photo in the form of a short story.

More details about the process of using PhotoVoice in this study are available in this [blog post](#) for the MECS programme.

- **Narrative Storytelling:** Personal stories were collected from people with disabilities that illustrate their journeys in accessing and using energy in different contexts—home, school, workplace, or public spaces. These narratives conveyed the emotional, social, and practical dimensions of energy access in ways that resonate beyond numerical data.
- **Drawing-Based Expression:** For participants who may find visual representation more accessible than verbal communication, drawing was used as a creative medium to express their experiences related to energy usage and challenges. Initial attempts were made to hold individual drawing sessions with participants, however this proved to be less effective than was hoped. Following this, a series of workshops were held with participants, led by facilitators trained in expressive arts Bhaipura Community Resource Centre of Prabhat Education Foundation and another at a Deaf and Mute School. These sessions followed a three-step process:
 1. **Warm-up:** Each session began with a free drawing activity to help participants feel comfortable with the materials and the act of drawing itself.
 2. **Prompts and Drawing:** Participants were then given specific scenarios related to energy access and asked to depict them visually. A key element of the exercise was asking participants to create three consecutive drawings: things they liked about cooking, their difficult experiences, and what changes they desired. Facilitators actively monitored comprehension of instructions.
 3. **Explaining the Drawing:** With consent, participants shared the meaning behind their drawings, either verbally or through sign language. These were recorded for transcription and later analysis.

More insights into the implementation of the drawing tool are available in this [MECS blog](#).

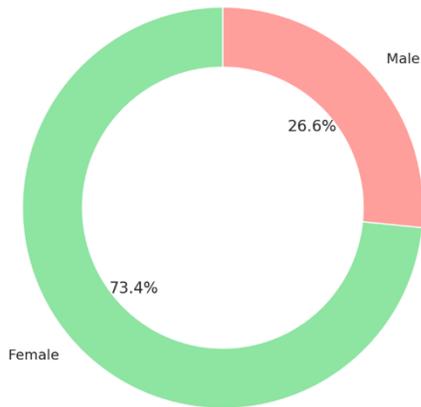
- **Key Informant Interviews:** Key informant interviews were conducted with a range of professionals including disability rights advocates, urban planners, rehabilitation experts, local government officials, and service providers. These interviews provide insights into systemic gaps, existing programs, and opportunities for inclusive energy planning and policy.

Together, these tools created a comprehensive picture of the energy landscape as experienced by people with disabilities in the selected study area, while also ensuring inclusivity, voice, and agency in the research process.

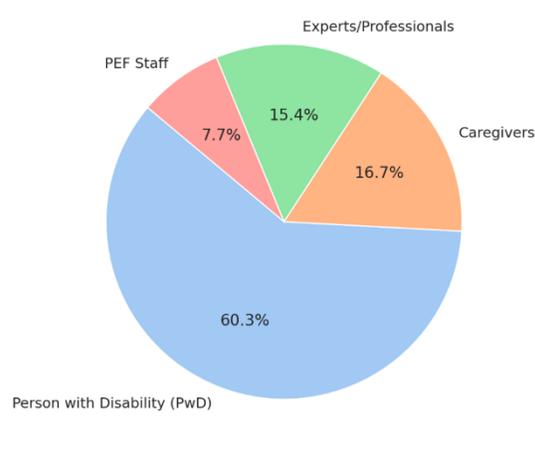
Sample Size

The sample (Table 1) was intentionally diverse, with an emphasis on qualitative depth, visual storytelling, and contextual insights rather than statistical generalization.

Graph 1: Gender Distribution



Graph 2: Distribution of Respondents by Category



Category	Participants
Semi-structured interviews with experts and professionals	9
Semi-structured interviews with PwDs and caregivers	16
Informal interview with expert	1
PhotoVoice participants – PwDs	5
Drawing participants – PwDs	21
Storytelling participants – PwDs	9
Multitier survey participants – PwDs and caregivers	17
Total Participants	78

Table 1: Distribution of participants across tools

Data Analysis

Data was co-analyzed by members of the research team. Descriptive statistics were used to analyze and present the findings of the MTF survey. Thematic analysis was conducted between members of the research team, incorporating the use of NVivo 11 software and manual thematic coding. All quantitative data from the MTF survey were analyzed using Google Forms.

Ethical Considerations

Ethical approval for this research was obtained from the Independent Research Ethics Committee (IREC, see: <https://www.irec.org.uk/>) in the UK prior to commencing fieldwork. The study adhered to IREC's ethical principles of intersectionality, justice, dignity, respect, fairness, honesty, and care.

Intersectionality was at the heart of the study, led by Dr. Amita Bhakta, a British Gujarati woman with Cerebral Palsy, who has an interdisciplinary background in sanitation, gender, and geography. She was supported by a team from Prabhat Education Foundation in India, whose members bring expertise in gender, literature, culture, development, and social work. The team members are originally from Gujarat and Madhya Pradesh.

Participants with multiple intersecting identities — such as disability type, gender, age, economic status, and caste — were recruited, including underrepresented groups like women with disabilities and elderly participants. People with disabilities in India are often marginalized due to cultural perceptions of disability. To ensure a comprehensive understanding of the wider context, participants with disabilities and their caregivers were recruited from diverse caste, class, and socioeconomic backgrounds.

Intersectionality was also considered when engaging **experts from various professional fields**, such as energy and the social sciences, across sectors including academia and local municipal authorities.

Participants had the **right to withdraw** at any time. To minimize the risk of misinterpretation, data was accurately quoted, attributed, and checked with participants where possible. For PhotoVoice and drawing exercises, **copyrights remain with the participants**. Therefore, original names of PhotoVoice participants are used in published outputs to maintain proper attribution and copyright.

Data from this research will be used **fairly, lawfully, and transparently** within the scope of the MECS programme. Participants were **informed** about how the **data would be anonymized and presented** — including in blogs and this report. Care has been taken to ensure **accuracy in the translation** of data from Gujarati and Hindi to English. The **data will not be stored for more than two years and will be held on password-protected computers**.

The dignity of **participants** was upheld by ensuring they were **free to participate or withdraw at any point**, that they felt comfortable sharing their views, and that their contributions were acknowledged through small tokens of appreciation, such as cooking utensils. Data collection took place in locations where participants felt safe and at ease.

Informed consent was obtained using a **consent form** (Appendix G), which was translated into Gujarati and Hindi. A **separate consent form was used for the PhotoVoice** activity (Appendix F), allowing participants to indicate how they wished their photos to be used.

Results

Summary of Sample Size by Distribution Across Methods

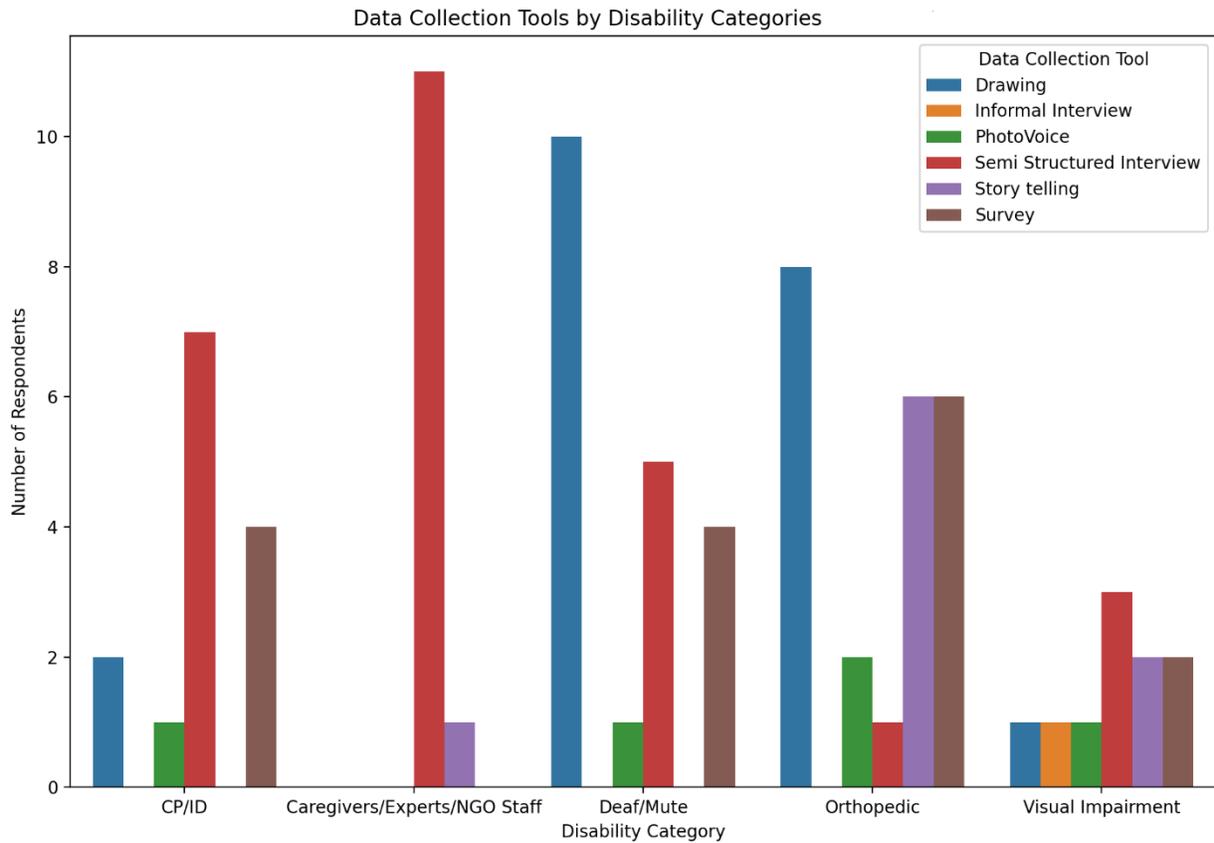
This study draws upon a mixed-methods approach combining qualitative and quantitative tools, and was conducted across various parts of Ahmedabad city. The focus was primarily on urban slum and low-income neighbourhoods, with a smaller group of middle- and high-income participants included to provide comparative insight.

The respondents were drawn from diverse locations such as Vatva, Lambha, Memnagar, Navrangpura, Narol, Saraspur, Ishanpur, and Bhaipura areas, capturing a realistic cross-section of marginalised as well as middle- and high-income communities in Ahmedabad.

In total, 78 respondents were engaged in the research through:

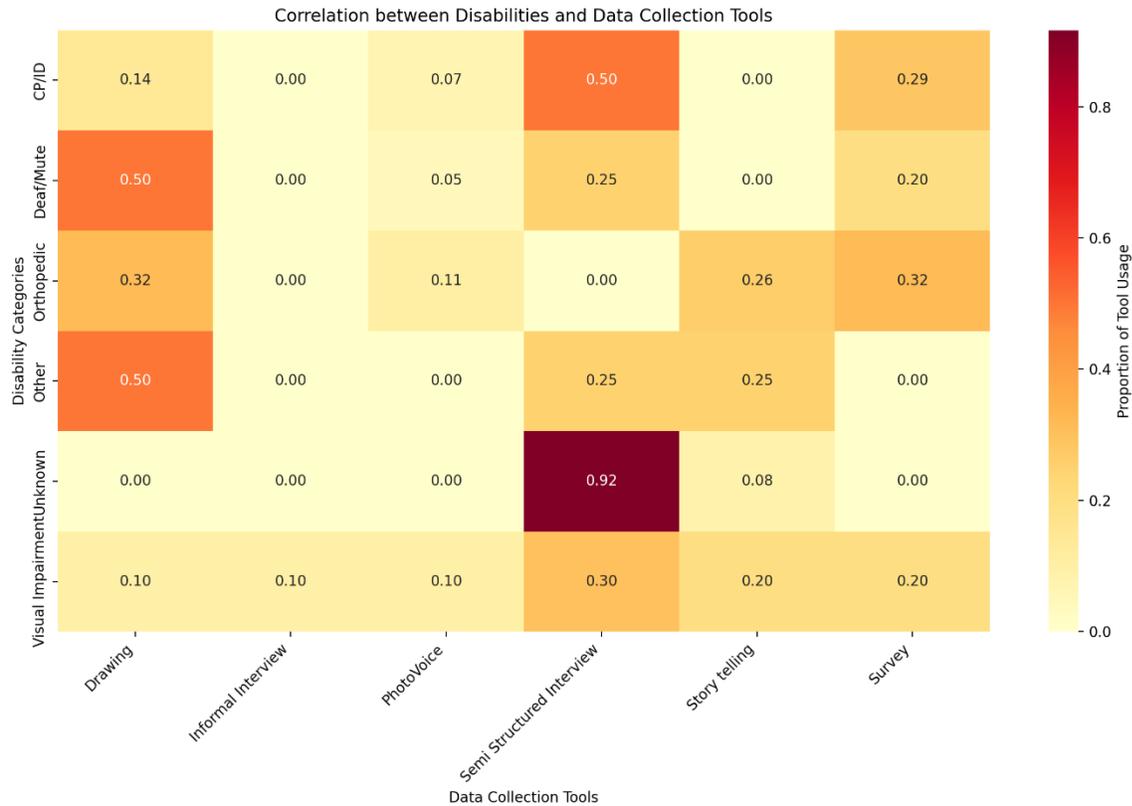
- Semi-structured Interviews (in-person): 26 households/offices, representing persons with disabilities, caregivers and Key Informant Interviews: Experts from institutions like CRC, NID, Prabhat Education Foundation, etc.
- Multi-Tier Framework Survey: 17 responses
- PhotoVoice (in-person at the participant's home) – Persons with Disabilities: 5
- Drawing (in-person and in workshop mode) – Persons with Disabilities: 21
- Story Telling (in-person) – Persons with disability: 9
- Observational and narrative inputs from other program field staff and community mobilisers

Graph 3: Data collection by disability categories



Participants with a range of disabilities were engaged in the research alongside caregivers, experts and NGO staff. Semi-structured interviews were conducted mostly with people with Cerebral Palsy, intellectual disabilities, caregivers, and experts and NGO staff. The majority of participants who took part in the drawing activities were Deaf/Mute, whilst story-telling and surveys were largely undertaken with people with orthopedic disabilities.

Graph 4: Co-relation between Disabilities and Data collection tool



1

Demographics: Persons with Disabilities

Men and women with disabilities in the study came from a wide age spectrum, representing a diversity of disabilities and income brackets.

Age

Participants ranged from late teens to older adults, with a concentration in the 25–45 years age bracket, indicating that the majority of PwDs surveyed were of working or caregiving age but often excluded from the energy decision-making landscape due to social and functional limitations.

Gender

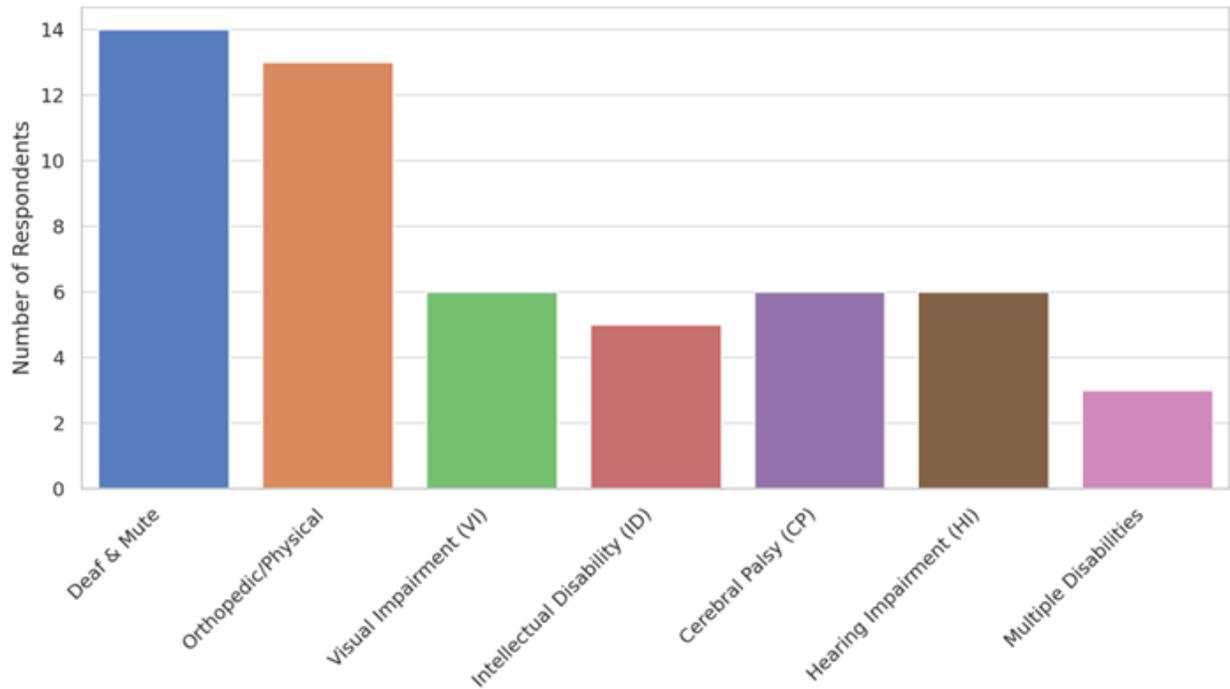
A nearly equal distribution was observed, with slight overrepresentation of female PwDs and caregivers, reflecting caregiving roles traditionally ascribed to women and increased vulnerability of women with disabilities in resource-poor settings.

¹ In the "Disability" section of the heatmap, the category labelled "Other" refers to respondents with **multiple disabilities**.

Type of Disability

- Cerebral Palsy (CP): 3
- Intellectual disability (ID) with cerebral palsy: 1 respondent
- Visual Impairments (VI): 6 respondents
- Physical disabilities: 19 respondents
- Hearing and speech impairments: 20 respondents
- Caregivers for persons with ID: 4 respondents
- Caregivers for persons with CP: 4 respondents
- Caregivers for persons with CP and ID: 2 respondents
- Caregivers for persons with VI: 1 respondent (she herself is VI with her two daughters who are also VI)
- Caregivers for persons with VI and ID: 1 respondent

Graph 5: Distribution of disabilities among PWDs



This variety reflects the intersection of accessibility needs across sensory, mobility, and cognitive dimensions.

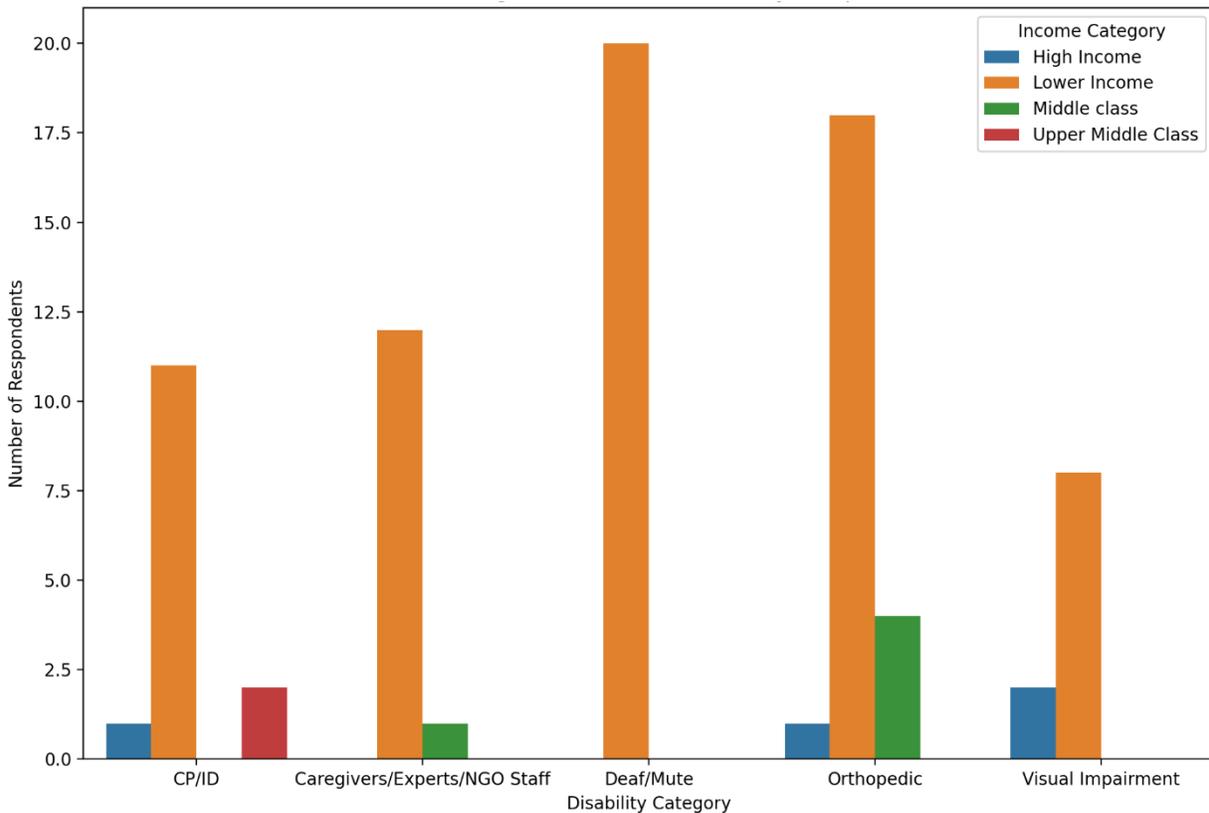
Income Bracket and Household Data

- Most households belonged to the economically weaker sections (Graph 6), with irregular or insecure sources of income such as daily wage labour, vending, or domestic work. A small minority of participants were in middle and high-income brackets, working in occupations such as motivational speaking or had businesses of their own.

- Several respondents flagged that even in electrified homes, economic insecurity limits actual usage—particularly for cooling devices, water heating, or assistive tools that require electricity.

“We have electricity, but we don’t switch on the fan in the afternoon. It adds to the bill,” noted one respondent, highlighting the gap between access and effective use due to affordability.

Graph 6: Income categories across disability groups



Demographics: Caregivers

In most households surveyed, caregivers emerged not only as the bridge between persons with disabilities (PwDs) and daily energy decisions but also as central figures in navigating financial, infrastructural, and emotional challenges. A rich tapestry of narratives revealed their invisible labour and systemic neglect.

These caregivers, often family members—predominantly mothers, spouses, and siblings—cared for individuals with a range of disabilities, including hearing impairments, physical and mobility challenges, intellectual disabilities, and multiple disabilities. The role of caregiving extended beyond routine support to include negotiating household energy expenses, accessing schemes, ensuring safety, and adapting domestic infrastructure for functional living.

Age

Caregivers spanned a wide age range, with a core cluster between **30 to 55 years**. The profile included young parents of children with disabilities and ageing spouses or mothers caring for adult PwDs. Many of them had been caregiving for over a decade—some with little to no respite or institutional support.

One mother in her 40s, who had been supporting her daughter with cerebral palsy, noted:

“Electricity isn’t a facility for us—it’s a necessity. Without light or a fan, her discomfort increases. But in summer, our bill crosses ₹700 and we have to borrow to pay it.”

Gender

As with most caregiving globally, the responsibility skewed heavily towards **women**. In the 17 households surveyed, over 80% of caregivers were women—mothers, grandmothers, or sisters. The emotional, physical, and financial burden of care disproportionately rested on their shoulders, often pushing them out of the workforce or limiting their participation in public life.

Type of Disability Cared For

The caregivers supported individuals with:

- **Hearing and speech impairments** (predominant in 5+ households)
- **Mobility-related physical disabilities**
- **Developmental and intellectual disabilities**
- **Multiple disabilities** in at least 2 households, significantly compounding the caregiving load

The caregiving experience often translated into a deeper understanding of accessibility challenges—from switch heights and LPG ignition mechanisms to irregular electricity supply disrupting routines and medical device usage.

Income Bracket and Household Income Data

The households fell within the **low-income bracket**, many subsisting on earnings from informal sectors—daily wage labour, tailoring, or small-scale vending. Several caregivers reported:

- Monthly electricity bills ranging between **₹300 to ₹800 (approx \$4 - \$10)**, with some prioritising electricity bill payments over groceries or other essentials.
- Limited or no knowledge of subsidies, schemes, or disability-linked concessions in electricity usage.
- A heavy reliance on **cash-based payments**, often made at local collection counters, with digital modes being either inaccessible or mistrusted.

In most cases, caregivers made deliberate choices to **curb energy consumption**—switching off cooling appliances or restricting cooking time to limit gas usage. These compromises had tangible effects on the health and well-being of PwDs.

Demographics: Experts

The study engaged with **six expert stakeholders** from diverse fields—urban planning, disability rights, community-based rehabilitation, inclusive design, and energy access. These experts represented institutions such as the **National Institute of Design (NID)**, **Composite Regional Centre (CRC)**, and **grassroots NGOs** working with children and adults with disabilities.

Gender

Among the experts interviewed, **an equitable gender distribution** was maintained, with both women and men contributing insights. Notably, female experts with lived experiences of working in low-income urban contexts brought nuanced reflections on gendered energy burdens and disability support gaps.

Background/Expertise

The experts offered layered perspectives, covering:

- Inclusive energy access design
- Disability-inclusive policy frameworks
- Assistive technology and adaptive environments
- Community rehabilitation in slums
- Public policy and social protection for PWDs
- Urban infrastructure planning

They consistently emphasized that **energy access has not been integrated meaningfully** into disability programming, and that **mainstream energy schemes lack inclusive design principles**—from application procedures to household-level adaptations.

A Blind Spot in the Development Sector: Access to Energy for People with Disabilities

The evidence gathered from and the process of conducting this study has highlighted that the energy needs of people with disabilities remain a blind spot for the development sector. Cooking, which remains primarily a female responsibility in most households, significantly intersects with the lived experiences of women with disabilities. Yet, because energy-related decisions and policy frameworks are predominantly shaped by men, these daily challenges are often ignored or deprioritized. This reflects a broader blind spot in the development sector, where the gendered and disability-specific dimensions of essential tasks like cooking remain largely invisible in planning, infrastructure design, and service delivery. Acknowledging this intersectionality is crucial to ensuring that energy access solutions are truly inclusive and address the needs of those most marginalized.

The realities on the ground reflect **the lack of research and attention to issues around energy, cooking and disability** in low- and middle-income contexts to date (Bhakta et al, 2024). Across engagements with people with disabilities and caregivers in Ahmedabad, it was evident that this issue had not been previously considered in policy and practice, reflected through the daily challenges they faced. This theme surfaced strongly across both the household interviews and

expert consultations. Electricity, fuel, and related services were seen **not just as infrastructure but as enablers of dignity, participation, and survival.**

“Energy access is a human right. For people with disabilities, it determines whether they can participate in daily life or remain confined,” said one disability expert.

The context for this lack of attention to this issue was clear through engagement with professionals. Some professionals, particularly in fields such as urban infrastructure planning and disability, openly **admitted that they knew very little about the topic.** In some cases, professionals even withdrew from interviews that had been pre-arranged having reviewed the questions to be asked, on the basis that they felt inadequately qualified to speak about the issue due to a lack of knowledge.

An interview with one urban planner, an expert on infrastructure in Indian cities, reflected on the **lack of data** on the topic as a result of multiple factors. One key factor was the **lack of a national census** in India since 2011²:

“... in absence of the fact that we do not have a 2021 census yet, there's a lot of... It's about 15, 18 years of... 15 years that we don't have any updated data to build on it. That's a big, big, big gap. It's a big gap.” (Urban planner)

Uncertainties over how much data on disability specifically was being gathered through the census were seen as a contributor to their energy needs remaining neglected in policy and practice. There is **minimal disaggregation** in energy data collection, and **no mandates on accessible energy infrastructure** (such as user-friendly switches or subsidy access protocols). **Data interoperability** was a significant concern; schemes for electricity access were not drawing on data about who is disabled:

“These two data or these two schemes have to talk to each other, right? Yeah. And that's the biggest problem. So, even if you have a scheme for providing electricity connection for disabled or to prioritize, where are you going to get the data for who's disabled? In the city or in the district, right? That data sits with somebody else.” (Urban planner)

Expert respondents pointed to systemic blind spots in both energy and disability policymaking. A senior academic noted:

“We don't collect data on PwDs' energy needs, so they're invisible in policy. The only time energy gets mentioned is when talking about electricity for schools or health centers.” (Academic)

National and local energy schemes rarely include disability-specific considerations. Discussions with urban planners identified that **disparities across different states** in the provision of fuel subsidies for people with disabilities and a lack of knowledge about the uptake and reach of these subsidies for people with disabilities who need them are part of the reason why little attention has

² The last Census in India was due in 2021 but was delayed due to the COVID-19 pandemic.

been paid to their energy needs. Experts reflected on the **lack of 'sensitivity'** at a government and policy level in India as a factor in the energy needs of those with disabilities remaining hidden. One expert emphasized how lessons on the need for granular data on energy could be taken on data gathered on other forms of infrastructure in slums:

“So, when we looked at water sanitation, infrastructure design, or when we looked at, say, a lot of work that we did in the [...] program, where we looked at what, at slums, what kind of public toilets, what kind of community toilets do you need to design? Or where should the community toilet be even located? Or even identifying households at a slum level, which has a person with disability. Right? Because otherwise, if you don't have that data also, how are you then going to ensure that that household has to have an individual toilet?” (Urban planner)

Misunderstood Energy: How Definitions Hide Disability Needs: Even among experts, confusion about what 'energy' means kept this issue invisible. One disability professional admitted they initially thought our research was about renewable energy and climate change - only later realizing we were examining basic access to electricity and cooking fuels. This misunderstanding reveals a critical gap: when even specialists imagine 'energy' as solely about power plants rather than kitchen fires, the daily struggles of disabled people remain overlooked in policy and practice.

Access to Electricity for People with Disabilities

Access to electricity among households with people with disabilities was measured by: household connections to electricity, access to a functional electricity meter, monthly expenditure on electricity, payment methods, and a narrative analysis of the physical accessibility of electricity infrastructure for people with different disabilities, as demonstrated through the qualitative data. Energy usage—especially related to cooking and household appliances—plays a critical role in their day-to-day functioning. However, the accessibility, safety, affordability, and usability of these energy-powered devices are deeply influenced by one's economic background, gender, and societal expectations.

Household Connections to Electricity

Nearly all surveyed households had an **electricity connection**, yet many experienced **frequent disruptions**, especially during summers and monsoons. In some areas, low voltage and power cuts interfered with the use of assistive devices, fans, and water pumping.

Access to Functional Electricity Meter

- Most households had a **functional meter**, but respondents shared difficulties in **understanding billing patterns**, especially where digital meters had replaced older analogue ones without explanation.
- Caregivers often lacked the **literacy or confidence to dispute incorrect bills**.

Affordability of Electricity

Monthly electricity expenditure ranged from **₹300 to ₹800**, depending on appliance usage and seasonal needs. **Cooling devices**, while essential for comfort and certain health conditions, were **used sparingly** due to fear of high bills. The majority of participants were on low incomes with a

basic level of earning at a household level. An **inability to afford** high electricity bills led to a preference for gas cookers over induction cookers. As an expert at the Blind Person's Association in Ahmedabad explained, when it comes to recurring expenses, induction cooking (in terms of electricity consumption) is often cheaper than gas. It is comparable to the cost of running a ceiling fan. In contrast, LPG cylinders are the most expensive option. However, despite being economical in the long run, the upfront cost of induction stoves or tactile devices is often prohibitive for many blind households.

Affordability of electricity has significant implications for meeting the health and daily needs of PwDs. Experts noted that families with limited financial resources often struggle to afford essential appliances, therapies, or home modifications that would enable safer and more accessible energy use.

These challenges are further intensified by Ahmedabad's extreme climate, where temperatures regularly exceed 40°C. This makes the use of fans, refrigerators, and coolers essential, thereby increasing household electricity costs. While **solar energy** was mentioned as a potential cost-saving alternative, it remains financially out of reach for many.

Despite these barriers, electricity was widely regarded as a basic necessity. As one female caregiver stated, it is simply "part of life's necessities," and participants acknowledged that, overall, Ahmedabad benefits from a relatively stable electricity supply.

Some participants with disabilities highlighted that **communal living**—such as staying in hostels—helps reduce electricity expenses compared to living independently.

Affordability was also closely tied to design. Many electric appliances and energy-dependent devices are not built with accessibility in mind, meaning that families must invest in costly post-production modifications. The lack of inclusive design at the manufacturing stage makes both usage and affordability more difficult for people with disabilities.

Payment Methods for Electricity

- Payments were made **in cash at local offices**, with very few households using online payment systems. Many lacked smartphones or internet access.
- **Delayed payments led to disconnection threats**, increasing stress among caregivers.

Infrastructural Factors in Access to Electricity

Infrastructure played a significant role in accessibility for people with disabilities. Infrastructural factors shaping access included design, safety, battery maintenance and differences between living in urban and rural areas.

Design

Households raised several **design-level accessibility challenges** in access to electricity. Switchboards were often placed **too high for wheelchair users, and children with mobility issues** and were difficult to reach. In order to turn switches on and off, people with disabilities

particularly from low-income households, needed to use adaptive techniques, as demonstrated through data gathered through PhotoVoice (Figure 2) and interviews, including using a stick.



Figure 2: अगर डट्टा लगा हो तो में लकड़ी वगैरह से चालू कर सकती हूँ। अगर डट्टा नहीं लगा हो तो मुझे किसीको बुलाना पड़ता है या बच्चोको बुलाना पड़ता है- कहना पड़ता है के पिन लगा नहीं है , पिन लगा दे। फैन हो गया, मिक्सर हो गया - निचे ही रखी होती है पर डट्टा लगाना पड़ता है - तब ही में इस्तेमाल कर सकती हूँ।

{English Translation: If the knob is attached, I can start it with a stick or something. If the knob is not attached, I have to call someone or the children - tell them that the knob is not attached, put the knob in. Be it a fan, a mixer - it is kept below but a knob has to be attached - only then can I use it.} (Photo © Shaheen Parveen)

Switchboard design itself was inaccessible in low-income households. **Narrow spaces** around switchboards made access difficult. In contrast, high-income households found routes to adapting the home to make switchboards more accessible, as found through a PhotoVoice with a high-income woman with Cerebral Palsy (Figure 3).



Figure 3: "મારા ઘરના દરેક રૂમમાં સ્વીચબોર્ડ નીચલા સ્તરે લગાવવામાં આવ્યા છે જેથી હું તેમના સુધી સરળતાથી પહોંચી શકું અથવા મારી વ્હીલચેર દ્વારા તેમને એક્સેસ કરી શકું. તે ખૂબ સુવિધાજનક બાબત છે."
 {English Translation: The switchboards in every single room of my house have been installed at a lower level so that I can reach them easily or access them through my wheelchair. It's a huge convenience.} (Photo © Rajviben Gosalia)

These findings suggest that the accessibility of electricity infrastructure has been relatively overlooked in infrastructure provision. Aspects of dexterity challenges and location of switches warrant further attention in meeting the electricity needs of people with disabilities.

Safety

Safety was a significant concern in relation to access to electricity for people with disabilities. Living conditions particularly led to fears over the safety of electricity connections in different parts of the house for people with disabilities on low incomes:

"Me and my small children have a problem with the electricity in the bathroom; we are worried that what if the light goes on and off and there's a blast one day?" (Deaf and Mute woman)

Disability experts also noted that fear of electric shock among children or intellectually disabled individuals led to restricted access to electricity. It was also noted that people with disabilities do not receive training or orientation from electricity providers on safe or adapted usage of electricity.

Battery Maintenance and Infrastructure Gaps

Gaps in electricity infrastructure also impacted the use of battery-operated devices for people with disabilities in Ahmedabad. Frequent breakdowns and the premature failure of batteries in powered tricycles—well before their stipulated 5-year replacement period—pose financial and logistical challenges. Repair services are often unavailable locally, with some users required to travel a long distance for servicing, thereby affecting the reliability and continuity of usage. These

issues underline the importance of localized maintenance infrastructure and quality assurance in device provisioning.

Urban-Rural Differences

Differences in disruptions in access to electricity between urban and rural areas in Gujarat were noted:

"No, not here in Ahmedabad. There is no disruption here with the electricity. There was in the village, but I am not living in the village now. I don't know how it is there now." (Woman with orthopedic disability)

One expert working in the disability sector who was a caregiver for her brother offered sharp insights into rural infrastructure challenges around access to energy in different ways. In her village, electricity supply is unreliable, with routine full-day blackouts (e.g., every Tuesday) and long outages during the monsoon (10–15 days). Solar streetlights installed under government schemes provide minimal lighting but are insufficient for holistic energy needs. Families that can afford rechargeable batteries manage better during outages, but poorer families are left without any alternative:

"ગામના ગરીબ પરિવારો તો ચાર્જેબલ બેટરી પણ ખરીદી શકતા નથી."

"Poor families in the village cannot even afford rechargeable batteries." (Disability sector expert)

Furthermore, internet access and smartphone ownership are sparse. This disability sector expert pointed out that in such a setting, reliance on digital solutions must be supplemented by practical, offline teaching methods. This gap between rural and urban energy realities affects how effectively persons with disabilities can access and benefit from modern assistive technologies.

Electricity as a Facilitator in the Development of People with Disabilities

Access to electricity was regarded by some people with disabilities as a critical factor in their personal development:

"There isn't such a thing that you can do without being able to use electricity. People in the villages without electricity are not progressing, they are just as they are. [...] You have to spread knowledge about it. And if they have access to the right things then they can move ahead." (Woman with orthopaedic disability)

Yet, some experts urged caution regarding the use of electricity for cooking. One expert suggested that cooking or the use of appliances is a 'higher-order' task, requiring a stable base of cognitive understanding, physical coordination, and strong parental involvement. It was suggested that introducing these tasks prematurely can result in confusion, fear, or injury—doing more harm than good. An expert noted how many children with ID experience day-to-day variability in memory and recognition—they may identify an appliance or tool correctly one day and fail to recall it the next. This inconsistency makes tasks requiring sequencing, memory, or safety adherence (like using a kettle or stove) unreliable and unsafe without strict supervision.

Institutional Energy Needs and Adaptive Solutions

Disability support institutions demonstrate diverse and critical dependencies on reliable electricity access. These facilities utilize power for:

- Educational technologies (smart TVs, computers, group induction systems)
- Assistive devices (hearing aids, cochlear implants)
- Vocational equipment (sewing machines, audio-visual aids)
- Specialized infrastructure (vibrational/visual alert systems)

An Ahmedabad Deaf and Mute school exemplifies this technological transition, having moved from traditional pictorial methods to digital learning platforms. However, persistent challenges emerge in:

- Device maintenance costs
- Inadequate adaptive infrastructure
- Energy reliability for essential equipment

Tenure restrictions compound these issues, as revealed by an NGO director: *"All our spaces are rented...we're forced to use what's available."* Despite constraints, institutions employ innovative workarounds:

- Motion-sensor lighting for safety and efficiency
- Passive cooling systems (industrial-style roof fans)
- Shared climate control solutions

These adaptive measures help mitigate costs but reveal a troubling paradox - while reducing energy expenditures, they simultaneously limit access to advanced rehabilitation technologies. As one director noted, *"innovation remains crucial for organizations to meet their clients' complex needs within financial and infrastructural constraints."*

Communication Barriers and Systemic Gaps in Deaf Accessibility

A striking disconnect emerged between expert assumptions and on-ground realities in deaf and mute accessibility. Where one specialist asserted sufficient technological support, field research at a Deaf and Mute School revealed persistent comprehension barriers despite:

- ✓ Certified interpreter involvement
- ✓ Written questionnaire adaptations

This disparity prompted the expert to reconsider, identifying potential contributing factors:

- Variations in cognitive development
- Uneven access to quality sign language education
- International vs. local support system disparities

The situation underscores three systemic improvements to deaf inclusion:

- **System Development:** Need for comprehensive sign language education frameworks
- **Social Awareness:** Importance of prioritizing communication accessibility
- **Family Engagement:** Value of complete sign language adoption in home environments

Untapped Potential of Renewable Energy Solutions

Gujarat's abundant solar resources present unrealized opportunities for disability support, particularly regarding:

- Solar-charged assistive devices
- Energy-efficient mobility aids
- Hybrid power solutions for institutions

One expert emphasized the need for targeted pilot programs assessing:

- Affordability for low-income users
- Durability in varied settings
- User acceptance across disability types

This gap represents both a challenge and opportunity - while renewable solutions remain underdeveloped, their thoughtful implementation could significantly improve energy access for people with disabilities across urban and rural contexts.

Access to Cooking Fuels for People with Disabilities

Cooking Fuels Used by Households with PWDs

LPG was the most common cooking fuel used, but not necessarily the easiest to access or use. Some households still relied on **wood or kerosene**, especially during LPG shortages. It was observed by participants that in rural areas of India, dependency on firewood for cooking was a significant challenge for people with disabilities living in villages. These difficulties were further exacerbated by a lack of a supportive environment that encourages independence for people with disabilities to become fully involved in cooking and other tasks.

Whilst many households used LPG cylinders, gas pipelines were viewed as more accessible to use:

“When gas pipeline connections were introduced in our area, we prioritized getting one because replacing cylinders and opening valves is difficult with one hand. Using the pipeline is easier. Even when the lighter doesn't work, I've figured out how to light a matchstick by fitting the box in one place.” (Woman with orthopedic disability)

Challenges in Obtaining Cooking Fuels

- Refilling LPG cylinders required physical travel to agencies or local delivery points—**a burden for families with mobility-impaired members**
- Caregivers had to **negotiate delivery timings and manage lifting heavy cylinders**, often without support.

Awareness and Access to PMUY (Pradhan Mantri Ujjwala Yojana)

Awareness of PMUY was **limited** among respondents. Some had availed the connection but **lacked consistent refilling support or follow-ups**. Procedures for PMUY access were described as **bureaucratic and inaccessible**, especially for low-literacy families.

A couple who both had disabilities and cared for each other noted how they benefited from the PMUY scheme, transitioning from an electric stove to a gas stove. After learning about the program, they applied and paid ₹2,200 (\$25 USD) to receive both a gas cylinder and stove. Additionally, they benefitted from a gas subsidy—each refill costs ₹800 (\$9 USD), but they received ₹300 (\$3.50 USD) back within 15 days. Since they prepared meals in bulk each morning, the gas lasted longer, reducing their overall expenses.

An urban planner involved in the empowerment of low-income urban poor women reflected on the importance of engaging self-help groups (SHGs) to expand access to PMUY including for people with disabilities:

“So, what was happening that we had database of SHGs, self-help groups, which are primarily of urban poor women. And what we started doing is that at least all of our urban poor women households should get access to Ujjwala.[...] So, we had the data and we were sharing this with the Ujjwala scheme people that at least now you have a data to saturate all of this with. So, that was something that we did. Yeah. [...] It reached, I think, I don't have numbers, but it reached quite a few lakh³ numbers.”
(Urban planner, Ahmedabad)

Impact of PMUY Support on Household Energy Use

In households where PMUY connections were successfully obtained, there was **initial improvement in cooking safety and health**. However, the **lack of ongoing subsidy support** led to reversion to cheaper fuels or extreme rationing.

Challenges Faced by PwDs in Using LPG

Using Liquefied Petroleum Gas (LPG) to cook posed significant challenges. One physiotherapist interviewed reflected on these challenges for individuals with disabilities, as many already struggle with activities of daily living (ADL). For instance, changing a gas cylinder is a strenuous task even for those without physical limitations—so for someone with an orthopedic disability, the difficulties are significantly amplified. Lifting and balancing a heavy cylinder while ensuring proper installation poses serious obstacles, making this routine aspect of cooking in India particularly inaccessible. Most households rely on gas cylinders or LPG for daily cooking, further emphasizing the need for practical solutions. The challenges of lifting, installing and using gas cylinders were clear through the PhotoVoice (Figure 4) and drawing data (Figure 5):

³ One lakh = 100,000.



Figure 4: I know how to install the cylinder but I cannot take it inside. I have to depend on someone else. I have to call my neighbours or my brother. Or if my husband is here, I have to ask him to install it or keep it inside so that I can install it. I need someone for this also. I cannot do it myself". (Photo © Shaheen Parveen)

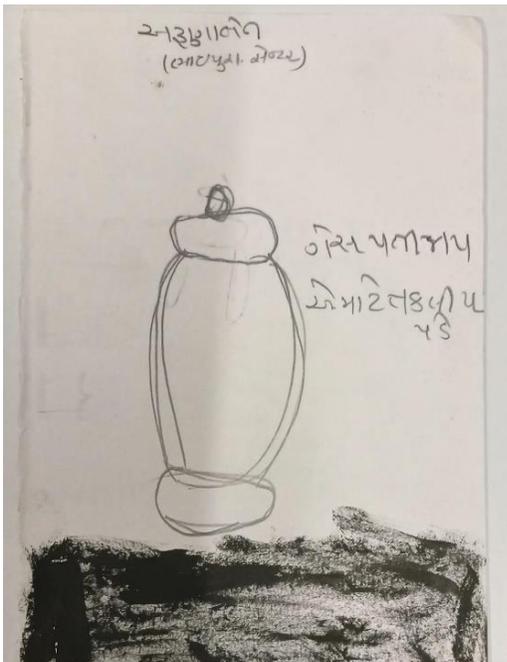


Figure 5 : Drawing of challenges with using gas cylinders (Drawing © Arunaben Makwana)

Ms. Arunaben Makwana and her husband both live with physical disabilities, with Arunaben experiencing more significant mobility limitations. In their household, her husband assists with cooking - a rare example of mutual support that partially mitigates accessibility challenges. However, Arunaben emphasizes that systemic solutions like piped gas infrastructure would dramatically improve their daily lives by eliminating the difficulties of cylinder replacement and installation. Their situation highlights both the potential of collaborative care models and the pressing need for disability-inclusive home infrastructure.

These experiences show that small infrastructure upgrades can reduce reliance on personal care networks and support greater autonomy for people with disabilities. The drawings also revealed that piped gas systems could be especially helpful in households where both partners have mobility impairments.

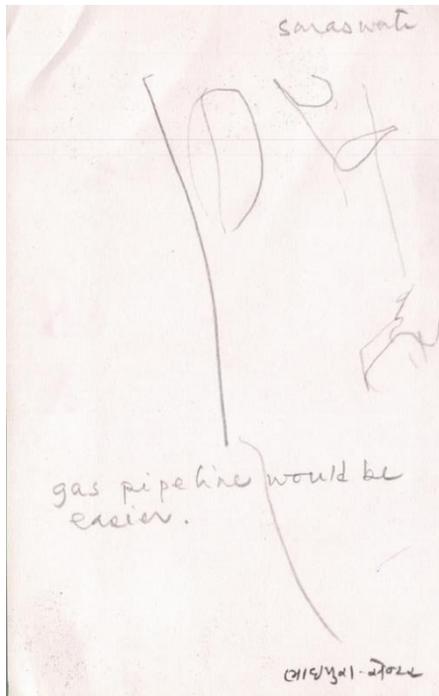


Figure 6: Drawing illustrating desire for gas pipeline (Drawing © Saraswati Dhanjibhai Marwadi)

Ms. Saraswati Dhanjibhai Marwadi, who lives with low vision, emphasized through her drawing (Figure 6) how piped gas infrastructure would significantly improve her quality of life. She explains that eliminating the need to handle heavy gas cylinders would reduce both physical strain and safety concerns, making kitchen tasks more accessible and manageable. This simple modification to energy infrastructure would provide greater independence in her daily cooking activities while minimizing the risks associated with cylinder replacement.

Her perspective aligns with universal design principles, demonstrating how infrastructure improvements intended for general use can have particularly transformative effects for people with visual impairments. Piped gas systems would eliminate multiple accessibility barriers simultaneously - from the physical challenge of moving cylinders to the visual difficulty of monitoring gas levels.

People with physical disabilities found **standard LPG stoves inaccessible** due to **high placement of burners**, and **manual ignition difficulties**. Hearing-impaired users found it challenging to use LPG stoves due to **lack of flame visibility**. Further, a **lack of adaptive kitchen tools or safety systems** meant many PWDs were **excluded from cooking entirely**.

Experiences of Cooking for People with Disabilities

Cooking experiences for people with disabilities in Ahmedabad were shaped by a range of factors: the role that their different senses play through the process; the physical challenges they faced and the ways in which they adapted; their experiences of using traditional techniques to cook Gujarati food; the emotional and social aspects of cooking; and, their experiences of cleaning up the kitchen after food is prepared.

Role of Different Senses

The reliance on a range of different senses to be able to cook was a striking finding among people with visual impairments. People with visual impairments relied on their sense of smell as they were cooking to determine issues with gas and odd electrical wiring issues, to ensure that they could stay safe.

Different senses were needed for the preparation of food itself. PhotoVoice with Hiraben Purohit, who was totally blind, provided insights into the importance of a sense of smell for those who are visually impaired:



Figure 7: "If I smell the container before I add the spices into the food, I'm able to tell if it's chilli, cumin, salt etc - it makes the process of cooking easier." (Photo © Hiraben Purohit)

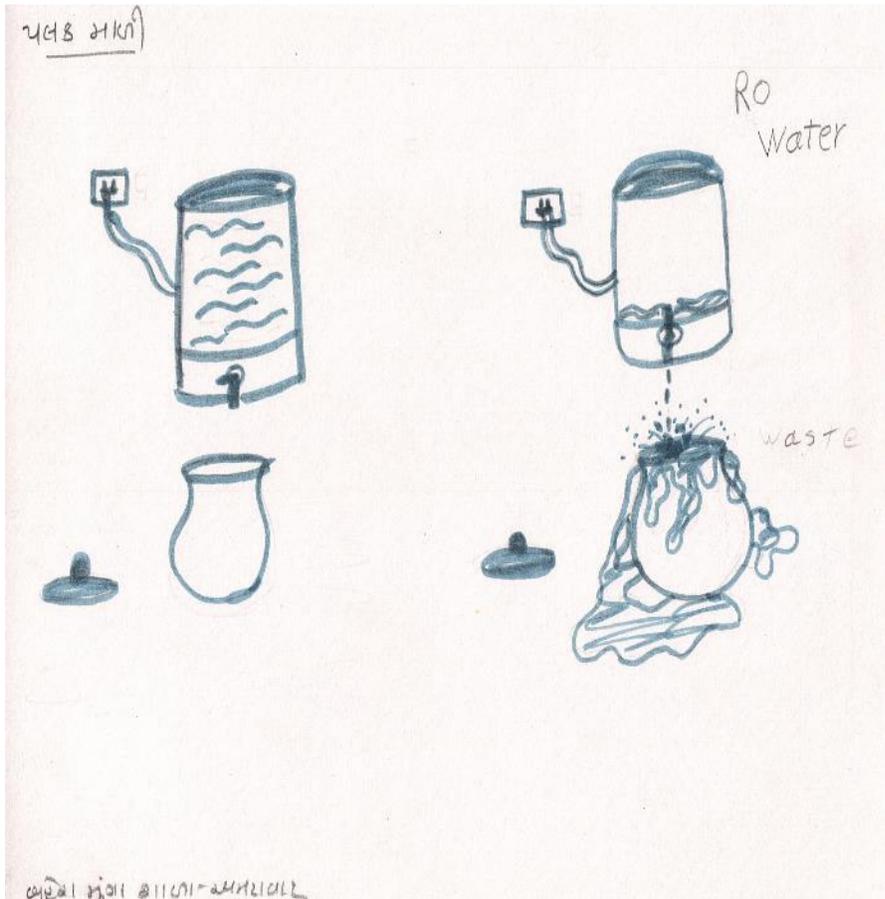


Figure 8: "Cooking a Roti is a difficult task, cause even if I check by my hands, sometimes one can't tell if it's properly cooked or not. If it is undercooked, it'll be raw; if it's overcooked, it'll burn. Until you smell the burnt flavour, you will not be able to tell it's cooked or not." (Photo © Hiraben Purohit)

Hiraben also illustrated through her PhotoVoice how cooking *Rotis* was a challenge. In the absence of sight, she was unable to tell if her *Rotis* were fully cooked, leaving the only options of feeling for the texture or cooking them on the stove until she could smell them burning. (Figure 8).

Being deaf or hard of hearing brought into focus the importance of visual cues. Through her drawing, Palak Mali described how her deafness significantly increases the time and effort required

for kitchen tasks. Without auditory cues, she must maintain constant visual attention on each activity until completion. This was vividly illustrated in her drawing (Figure 9) - when filling water from the RO system, she cannot step away even momentarily, as she cannot hear when the container is full. The need to stand guard throughout the process not only prolongs simple tasks but also leads to frequent overflows when she's unavoidably distracted, resulting in both wasted water and additional cleanup work.



This example reveals how standard appliance designs that rely on auditory signals create disproportionate burdens for deaf users. Simple modifications like visual indicators or automatic shut-off mechanisms could significantly improve accessibility and reduce resource waste in such situations.

Figure 9: Drawing of experiences of filling water for deaf people (Drawing © Palak Mali)

Physical Challenges and Adaptations

Cooking, for most PWDs and their caregivers, involved a series of workarounds, including **stools or ground-level cooking** setups for wheelchair users, limited cooking hours during daytime due to **inadequate lighting**, and a risk of burns due to **unshielded flames** or absent sensory feedback.

Safety: Gas, Burning and Using Open Flames

A key concern among people with disabilities and caregivers was safety, particularly when using gas and open flames. One man who was deaf and mute described his difficulties with a gas stove. While he frequently turns it on and off, there are times when the flame does not extinguish completely, and he detects the smell of gas. This raises safety concerns, as he may not always be

able to confirm whether the stove has been turned off properly. He worries that if unnoticed, a gas leak could pose a serious hazard. Other participants who had hearing challenges also reflected on challenges they faced when using a gas cooker:

“When I have the gas cooker on and I turn it up, there’s usually a noise, I use the lighter but there is a noise. But I have to keep doing it again and again. Somebody came to the house and they suggested that we get a gas pipeline fitted, otherwise there is a risk that there might be a fire one day.” (Deaf and Mute woman)

Participants raised a wide range of challenges related to gas use. Lighting gas lighters was a difficult task that posed the risks of flare up if the gas is on. Gas being left on, particularly from a cylinder, was viewed as hazardous for those with disabilities. Some participants felt that having a gas pipeline compared to a cylinder and more modern forms of gas stoves made them feel safer, but the need to be alert in using gas and turning it off before completing other tasks such as taking utensils from other places was important, particularly due to their disability and specific challenges they faced. For blind users, a reduced need to manually switch or transport gas cylinders was seen to lower the risk of accidents. Quick access to a switch to turn gas off was important for people with disabilities. One expert reflected on the safety risks of using gas for people with different disabilities:

“My mother has Parkinson’s... she forgets to turn off the gas. The same risk applies to a young adult with cerebral palsy.” (Design expert)

In light of the risks the use of gas poses for people with disabilities, disability organizations showed a preference for electrical appliances for cooking with people with disabilities because they were considered safer, but this was often limited by cost. Safety concerns at an organizational level also led to differentiation in the cooking skills people with certain disabilities were taught. At one organization, children with intellectual disabilities (ID) are taught basic kitchen tasks (e.g., placing potatoes in a cooker) but are not allowed to operate gas stoves independently. Experts also noted how visually impaired individuals (VI) can perform tasks like making roti with relative ease, but open-flame cooking, frying, or tasks requiring finer control present serious challenges. Solutions suggested to overcome these challenges include the use of pressure cookers, protective clothing, and safer ignition systems.

Some participants shared that they found gas stoves easier to use than electric cookers. One respondent expressed concern about using an electric *sagdi* (stove), describing it as difficult to operate and potentially unsafe — particularly with steel utensils. As a result, they reserved its use for specific tasks like boiling water or making tea during *Sheetala Saatam* — a Hindu festival celebrated in Gujarat, during which freshly cooked food is avoided, and meals are prepared in advance.

Electric *sagdis* were often perceived as more mechanically complex, with unfamiliar buttons and settings that were harder to interpret. In contrast, gas stoves were seen as more intuitive, requiring only basic control over the flame.

A key risk factor for people with disabilities was burning themselves and being injured, and burning food, particularly *Rotis*. Roti making often led to both the *Rotis* and the people with disabilities getting burnt. Whilst technologies such as roti makers are available to help to overcome these issues, there was resistance to using them for the 'hand cooked' feel of the *Rotis*. For people with visual impairments, cooking involved the use of utensils such as a *Taavetha* to avoid getting burnt as they made *Rotis*, as revealed through PhotoVoice (Figure 10).



Figure 10: “So that the hot Roti does not touch my hand and burn me, I will raise it higher with Taavetha (flat iron instrument with long handle to flip or turn food on the frying pan). It’s a little tough because the fear of being burnt is too much when flipping the Roti...” (Photo © Hiraben Purohit)

Design and Use of Cooking Appliances

The ways in which cooking appliances were designed shaped the ways in which people with disabilities were able to cook.

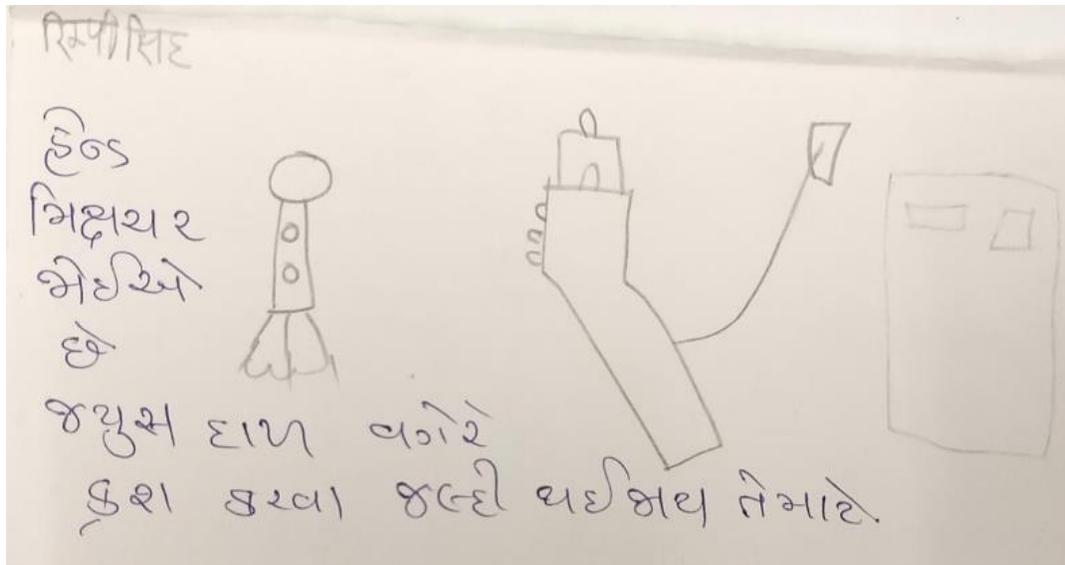


Figure 11: Drawing of handheld mixer use (Drawing © Rimpi Singh)

Ms. Rimpi Singh, who has limited mobility in one hand, highlights how single-hand operable appliances significantly improve her kitchen efficiency. She specifically finds hand mixer-type devices invaluable for food preparation tasks like crushing lentils, making juices, and preparing *chhaas* (Buttermilk). These adaptive tools not only enable her to work independently but also dramatically reduce task completion time compared to conventional two-handed appliances. Her experience underscores the transformative potential of inclusive kitchen technology in empowering individuals with upper-body mobility limitations. This aligns with WHO guidelines on assistive technology, which identify single-hand operable devices as crucial for maintaining independence in activities of daily living. Her testimony argues for subsidy programs to make such adaptive appliances more accessible to low-income households with disabled members.



Figure 12: મારા મિક્સરને ટૂંકો વાયર છે અને હું લાંબા સમય સુધી ઉભી રહી નથી શકતી તેથી જ્યારે મારે કોઈ પણ ઉપકરણનો ઉપયોગ કરવો હોય ત્યારે રૂમની બીજી બાજુ આવેલા સ્વીચબોર્ડનો ઉપયોગ કરવો પડે છે. હું તે સમયે પલંગ પર બેસી શકું છું અને ઉપકરણનો ઉપયોગ કરી શકું છું જે સરળ છે પરંતુ ત્યાં પહોંચવું મુશ્કેલ છે.

{English Translation: "My mixer has a short wire and I can't stand for long so I have to use the switchboard that is on the other side of the room each time I want to use an appliance. I can sit on the bed then and use the appliance which is easy but getting there is difficult."} (Photo © Rekhaben Rawal)

The use of mixers and blenders as part of daily cooking routines was commonly discussed by people with disabilities. Preferring the taste of homemade blends, mixers were used to make fresh *khada masala* for meals using a mixer, even though these spice blends are available in the market. One couple who both had disabilities noted that before buying the mixer, they used a pestle and mortar for grinding spices—a time-consuming process that takes an hour to achieve a fine paste. The richer flavor of traditionally prepared spices was still however a preference and they used the pestle and mortar on Sundays when they had more time. By contrast, the mixer reduced this process to just five minutes, making cooking far more efficient daily.

Some participants were not using mixers. Some people with disabilities did not feel comfortable using them because they had not been taught how to do so. Other reasons for not using them were because other family members had placed them too high up in storage.

Participants mentioned that they had used *Surya* (solar) cookers. Some adapted cooking appliances were found, though these were very rare in the market:

“With hand blenders, they come without a stand, so often when we are making chas or kadhi or dal, it falls. I found one with a stand so it doesn’t fall and it can stand by itself by the cooker, so I found something to lean it against. With ovens, you can get those that are talking, digital, but you need those dials for 1, 2, 3 etc like you get with a washing machine. So, what I have done is remembered which button I need to press by the sound that they make, so if you press the first button it makes one sound, if you press the second button it makes a different sound.” (Visually impaired woman)

Overall, cooking and kitchen appliances were challenging for people with disabilities. Use of fridges was limited for participants who could not reach higher shelves due to orthopedic disabilities and were restricted to only taking things from the bottom. There was a general view among people with disabilities that cooking appliances had not been designed for them, because they had not seen any kind of technology that would make things easier for them.

Experts also offered some reflections on the design of appliances. Most gas stoves lack design considerations for low-vision or blind users. Colour contrast between knobs, burners, and surfaces is poor, making it difficult for low-vision individuals to distinguish areas of interaction. For fully blind users, locating the exact burner spot to place utensils is another common challenge due to the absence of tactile indicators or raised guides. One expert suggested that blind people are “*cooking without looking*”: This phrase captures the essential difficulty faced by blind individuals in kitchens designed without inclusive features. There is a need for assistive tools, kitchen layout redesign, and training in safe techniques to reduce this dependency and enhance safety.

Beyond gas cylinders, operating kitchen appliances presents additional difficulties. Many appliances require strong grip and precise pressure to function—skills that individuals with certain disabilities may find difficult to manage. More accessible designs, such as sensory-activated controls or automatic knob-turning mechanisms, would greatly enhance usability for people with disabilities. Multi-sensory feedback in inclusive designs that incorporate auditory (e.g., pressure cooker whistles) and tactile cues to compensate for sensory impairments, thereby enhancing usability for diverse users, were felt to be critical for the inclusion of people with disabilities in cooking:

“We emphasized tactile feedback. If you have a hand mixer, you can put it in and feel it right away.” (Design expert)

Other reflections on the potential of inclusive design for cooking appliances for people with disabilities were noted by caregivers, including auditory and visual markers, such the distinct ‘tick’ sound when a gas cooker is turned on and color-coded signals on phones and televisions, to support people to grasp concepts related to electronic devices. Automatic switch-off functions for gas stoves

were also regarded as a potentially useful feature, and alternative options for conventional gas stove knobs, which can be harder to grip and turn. Self-locking blenders and mixers with simple switches to operate are more user friendly, whilst roti makers were seen as a potentially useful appliance for people with Cerebral Palsy.

Adaptive solutions were key to the inclusion of people with disabilities in cooking. Motor-impaired individuals (e.g., one-handed users) face difficulties in tasks requiring bilateral coordination (e.g., cutting vegetables). Experts in inclusive design suggested innovative, low-cost adaptations like vacuum pads to stabilize objects for one-handed users:

“We have two hands. One hand is for stability; the other hand is for action... So, we made a device for that—if you have a vacuum pad, it will be stable, and you can cut with one hand.” (Design expert)

Tactile-feedback-based designs were emphasized, including tools that provide immediate sensory responses, such as hand mixers, which can enhance usability for visually impaired users. Feedback design is important for visually impaired individuals, who struggle with tasks requiring visual feedback (e.g., boiling water, gauging heat).

The need to design cooking products for all was clear. Accessibility was noted as rarely considered at the design stage in India, making post-production modifications to appliances costly and inefficient. Professionals noted how assistive devices often cater to niche users without considering universal design principles (e.g., elderly, low-vision users). One academic specializing in inclusive design championed the philosophy that designs tailored for the elderly and disabled ultimately benefit everyone. For example, a product designed for one-handed use can be used by anyone in temporary situations like injury:

“If you design for the elderly, everyone can use it. But if you design only for youth, others can’t.” (Design expert)

In essence, this expert emphasized how designing for the elderly was in fact beneficial to all.

Cooking practices in the context of rural India were seldom considered by design companies:

“In villages, elderly and disabled individuals both need tools for floor-level cooking, but companies design only for standing users.” (Design expert)

Disability sector experts noted that beyond gas cylinders, operating kitchen appliances presents additional difficulties. Many appliances require strong grip and precise pressure to function—skills that individuals with certain disabilities may find difficult to manage. More accessible designs, such as sensory-activated controls or automatic knob-turning mechanisms, would greatly enhance usability for people with disabilities.

One of the major issues in appliance design is that manufacturers primarily target a neurotypical audience, often overlooking the needs of people with disabilities. As a result, these appliances are not designed with accessibility in mind, making them difficult for individuals with disabilities to use. This creates a dual limitation—people with disabilities are not only restricted by their own

physical or cognitive challenges but also by the assumptions and lack of consideration from those designing the tools meant to assist them. When it comes to kitchen appliances, individuals with disabilities are rarely considered the target audience. Most instruments and devices are built with standardized functionality, failing to accommodate varying needs.

To foster true inclusivity, appliances should be designed in multiple versions, each catering to different user requirements. Customization options should also be available, allowing users to modify features based on their specific needs. By integrating accessibility into design, manufacturers can ensure that people with disabilities are not forced to adapt to rigid, neurotypical standards, but rather, are given tools that genuinely support their independence and daily living.

Kitchen Design

Despite the challenges they face, individuals with disabilities have found ways to adapt their kitchen environments to suit their needs. Those with orthopedic disabilities or cerebral palsy often restructure their spaces, shifting kitchen shelves closer to the floor for better accessibility. ‘*Sitting kitchens*’ were common among people with disabilities who would cook on the floor (Figure 13), yet the need for floor-level cooking was not recognized by kitchen designers and manufacturers:

“In villages, elderly and disabled individuals both need tools for floor-level cooking, but companies design only for standing users.” (Design Expert)



Figure 13: “We have a sitting kitchen in the house. So, if I take few things with me while sitting, it makes the process of cooking a little easier.” (Photo © Rekhaben Rawal)

People with vision impairments have also devised creative solutions, such as placing tactile markers like *bindis* near appliance buttons to help them identify placements and operate devices effectively. While these adaptations showcase resilience and ingenuity, they also highlight the need

for better-designed appliances and infrastructure that prioritize accessibility. Implementing technology-driven modifications can create a more inclusive kitchen environment for all.

Some households had attempted minor adaptations, like lowering kitchen platforms or adding rubber grips to knobs. But these were **self-funded, makeshift solutions** in the absence of institutional support.

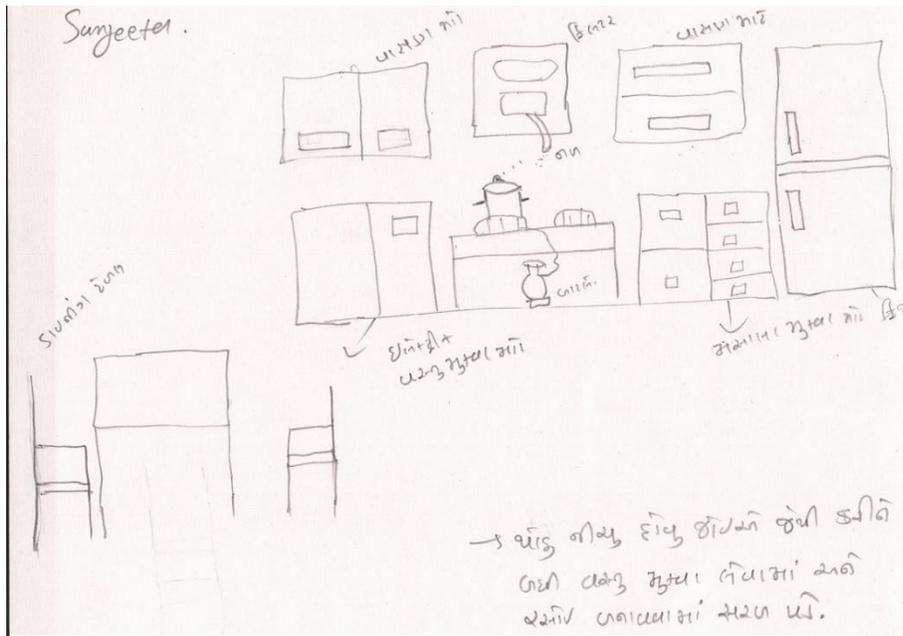


Figure 14: Drawing of kitchen infrastructure (Drawing © Sangeeta Vaghela)

Through her drawing, Ms. Sangeeta Vaghela reveals the profound challenges she faces in accessing basic kitchen infrastructure due to her limited mobility. As someone who navigates her home by crawling, she struggles with the conventional design of kitchen spaces—where appliances like the gas stove, refrigerator, and storage cabinets are installed at standing height. This forces her to exert extraordinary physical effort for daily tasks like cooking, often leading to discomfort and risking injury. Her depiction highlights how standard kitchen layouts exclude individuals with diverse mobility needs, transforming essential activities into exhausting ordeals.

Sangeeta's experience reflects a widespread need for adaptable kitchen spaces in urban housing, aligning with global standards like the UN Convention on the Rights of Persons with Disabilities (CRPD), which mandates accessible living environments.

Kitchens being 'higher up' were a challenge for people living with cerebral palsy and orthopedic disabilities:

"If the gas cooker is higher up, I will still try to make something for myself. I will try and climb up on the stool to cook, but it is difficult for me to see but I still try and make something! [...] It is possible to have worktops in the kitchen that are lower down- before our worktop was lower down. In the house I live in here for my job, the worktop and kitchen is higher up, but before where I lived in a rented house, there was no such thing and I was able to cook sitting on the

floor easily. The cupboards were also lower down, but now I am not comfortable cooking food because everything is higher up.” (Woman with orthopedic disability)

This woman was restricted by not being fully ‘settled’ in Ahmedabad and living in a hostel. If she was able to, she would set up her kitchen so that can take tubs and tins for herself, and set up the cupboards that way. There was also a preference for having a stone worktop built lower down for ease of use.

Another woman described how she has constructed a makeshift kitchen using bricks and temporary walls. Due to her inability to stand for extended periods, she has adapted the setup by keeping appliances and workstations at a lower level, ensuring she can cook without unnecessary movement or strain. However, her long-term goal is to build a fully structured kitchen with a proper platform. While she herself plans to continue cooking at a lower level by adjusting the gas stove to the ground, she hopes a standing platform kitchen will be more suitable for her daughters, making meal preparation more comfortable for them in the future.

While these adaptations showcase resilience and ingenuity, they also highlight the need for better-designed appliances and infrastructure that prioritize accessibility. Implementing technology-driven modifications can create a more inclusive kitchen environment for all.

Fine Motor Skills

Limited fine motor skills determined the extent to which people with disabilities were involved in cooking. One caregiver who had a daughter with cerebral palsy noted that she did not teach her daughter to cook due to lack of control over her grip. Being unable to turn on a lighter, it limited the scope for her daughter to learn cooking skills, to the extent that the caregiver did not even give them a matchbox because it was seen as dangerous. Any tasks involving grip such as using a manual chopper and cutter, using cleavers, tongs, clamps and scissors in the kitchen were challenging for those who lacked grip, at times restricting their activities to only putting things away in the kitchen. An expert on disability provided further reflections, stating that a lack of fine motor skills restricted the independence of people with disabilities in being able to use kitchen appliances. Many children have underdeveloped fine motor skills, making it hard to operate even basic devices (e.g., turning a stove knob or holding a kettle).

A high-income woman who had lost her hand in an accident described in depth through storytelling her experiences of re-learning cooking skills with just one hand:

“Learning to make Rotis felt like being a 6 or 7-year-old child again. The shapes would come out all wrong initially, but with practice, not only did I learn to make Rotis, I also mastered making Bhakhris, parathas, Puris, and more with one hand. Now, I can even serve fresh Rotis to five or six people at once. Cutting vegetables was a bigger challenge—especially peeling them. Even today, I can’t peel certain vegetables by myself. My mother-in-law helps me with that. Holding the vegetable and peeling it with one hand is difficult. If there were a machine to help with that, it would be a great support. For chopping other vegetables, I use cutters and similar tools which make the task manageable. I also practiced using different kitchen appliances and gradually learned to operate them all with one hand.

[...] All these skills developed through practice. It all depends on how strong your will is.” (High-income woman with orthopedic disability)

Poor fine motor skills affected many people with disabilities, whether their impairments were from birth or acquired. The narratives of the people involved in this research reflect that these aspects of preparing food remain largely overlooked for people with disabilities and need further attention.

Cooking Gujarati Cuisine

Cooking Gujarati food was a process. The first tasks of obtaining and preparation of different ingredients for cooking often posed challenges, and people with disabilities needed to adapt in different ways. Obtaining ingredients such as vegetables before cooking was an overlooked challenge, which Rekhaben, a shop vendor with an orthopedic disability was able to illustrate through PhotoVoice:



Figure 15: “ફિજ દુકાનમાં છે અને રસોડું ઘરમાં છે એટલે કઈ રાંધવા માટે વસ્તુની જરૂર પડે ત્યારે ઘરેથી દુકાન સુધી વસ્તુ લેવા ચાલવું પડે અને પાછા આવવું પડે એટલે ઘણી વાર લાગે.”

{Translation: “The fridge is in the shop and the kitchen is in the house, so whenever I cook, I have to walk from home to shop and back carrying things which takes time.” (Photo © Rekhaben Rawal)}

Preparation of vegetables required adaptation through washing and soaking, and through making knives blunter, especially for people who were visually impaired, which was clear through storytelling and PhotoVoice (Figure 16):

“I have difficulties with cutting vegetables too, but with this you need to put your vegetables such as cucumber and cauliflower into water in the morning, so then any bugs and dirt clears and it becomes easier to wash them. You shouldn’t use vegetables without putting them into water.” (Visually impaired woman, storytelling)



Figure 16: “ચપ્પુની ધાર કાચી રાખું છું એટલે શાકભાજી સમારવા સહેલા પડે છે જમવાનું બનાવામાં થોડી વાર લાગે પણ વાગે નહિ.”

{English Translation: “I keep the edges of the knife a little dull so it’s easier to chop and cut vegetables in the process of cooking. Surely, it takes time but it saves me from knife-cuts.” (Photo © Hiraben Purohit)

People with disabilities also raised challenges including not being able to carry too many ingredients together from one part of the house to another due to issues with their leg, and needed to make multiple trips to get everything together.

A common theme for many participants was the experience of making *Rotis* and *Puris*. Participants with visual, orthopedic and hearing impairments illustrated their varied experiences of making *Rotis* and *Puris* through PhotoVoice:



Figure 17: “ચાણણીથી (ચાળણી) લોટ ચાળવો સહેલો છે કારણકે એની હકનારી એ હાથ ફેરવીને લોટ ઢોળાય નહહ અને ચળાઈ જાય.” (English Translation: “It is easy to sift the flour through sieve as I can move my hands around the edges of the sieve and the flour gets sifted easily.”) (Photo © Hiraben Purohit)



Figure 18: રોટલી વણવાનું કામ થોડું સહેલું પણ છે, થોડું અઘરું પણ - હાથ ફેરવીને જોવું પડે ગોળ થાય છે કે નહિ.

{Translation: "The work of rolling a Roti on the rolling pin can be easy and tough at the same time - I have to keep moving my hands on it constantly to check if it is being rolled round or not." (Photo © Hiraben Purohit)}



Figure 19: લોટ બાંધવાનું સૌથી સરળ પડે મને કારણકે મારે એમાં ખાલી હાથની જરૂર છે, પગની નહિ. એ હું બેઠા બેઠા આરામથી બાંધી શકું." {Translation: "Kneading the dough is the easiest of activities in cooking because I only need my hands for it. I can sit down comfortably and knead it." (Photo © Rekhaben Rawal)}



Figure 20: મમ્મીને કામ કરતા જોઈને લોટ બાંધતા, રોટલી બનાવતા શીખી છું. પૂરી અને ભાખરી પણ બનાવું. મને પુરી વધારે ભાવે.

{Translation: "I watch my mother work and have learned to knead dough and make *roti*. I can also make *puri* and *Bhakhri*. *Puri* is my favorite!" (Photo © Sheelaben Bhoi)}

PhotoVoice data revealed how some aspects of making *Rotis* were easier, whilst some aspects were harder. PhotoVoice showed that participants had different perspectives on which aspects were easier or harder according to their impairments, in these cases either blind, deaf, or having an orthopedic disability.

Making *Rotis* required practice for people with visual impairments, particularly by mastering local traditional techniques:

"I enjoy cooking everything. I face some difficulties when cooking Rotis on the stove, particularly with the technique to hold the Rotis and turning them over, I had to take extra care, but with practice the turning becomes less of an issue. But you need to practice. I started to learn some of this before I went to university when I was in the 10th-12th grade, little by little, but not everything." (Woman with visual impairment)

An expert involved in supporting people who are blind reflected on how eye-hand coordination becomes particularly complex when using hot surfaces or open flames. While there are techniques that enable blind individuals to cook safely, certain tasks remain exceedingly difficult. Making *Rotis*

or *Puris* and cooking poppadom for instance, is often avoided due to the risks associated with deep frying, hot oil splatter and exposure to open flames:

“I have most difficulties with making Rotis and I find frying challenging. I find it difficult to make my Rotis puff on the stove, and frying or cooking papad (poppadom) is difficult for me because you have to do these directly on the open flame on the stove. There is a technique to it. Once you practice it then for many people it becomes easy. Everyone has a different technique to cooking.” (Woman with visual impairment)

People with visual (Figure 21) and orthopedic disabilities also noted a preference for cooking certain Gujarati staple foods because they were easier to make.



Figure 21: ચમચાથી આમ તેમ ફેરવી દઉં એટલે શાક થઈ જાય, આ તો સહેલું કામ છે.

{Translation: This is an easy task to do because I only have to flip the vegetables with my spoon a bit and it gets cooked.} (Photo © Hiraben Purohit)

Emotional and Social Impacts

Cooking was described not just as a chore but as a **source of identity and independence** for some PwDs. Being unable to participate in cooking **undermined their sense of agency** and deepened dependency.

“When I can cook, I feel like I am contributing. But when there is no gas or it is too hot to move, I just sit and wait,” shared a visually impaired young woman.

Cleaning

The process of cleaning before and after cooking had a mixture of social and physical implications. One caregiver stated how the person with an intellectual disability they cared for was more involved in washing-related tasks:

“She (daughter) does the roti herself, and she washes the vegetables, and the bottles she will wash them and put them aside. Any washing related tasks she will do.” (Caregiver)

People with disabilities also found cleaning the kitchen time consuming. For those with orthopedic impairments, it was difficult to lift and carry too many vessels at once for washing, and to mop the floor by bending their legs down. Yet one woman expressed her enjoyment in cleaning vessels and the kitchen as part of the cooking process, reflecting how cooking experiences go beyond the preparation of food alone.

Assistive Devices and Energy Dependency

Electricity plays a critical role in the everyday functionality and health of persons with disabilities (PWDs), particularly for those who use energy-dependent assistive devices. Across interviews, caregivers and persons with disabilities highlighted the reliance on devices such as CPAP (continuous positive airway pressure) machines for sleep apnea, electric wheelchairs for mobility, cooling fans for sensory regulation, and even nebulizers and suction machines for respiratory ailments.

Several families described how **unpredictable power cuts** directly compromised the use of such devices, resulting in severe discomfort and even health emergencies. One mother of a child with cerebral palsy explained:

“If there’s no electricity, I can’t use the suction machine. Mucus builds up, and I have to keep patting his back all night.” (Caregiver)

The dependency on electricity transforms a typical “utility” into a **lifeline**. Households with PWDs experience heightened vulnerability in the face of energy disruptions—whether due to overloading in informal settlements or disconnections during bill delays. However, none of the respondents reported receiving **priority consideration** from utility providers or schemes in light of these vulnerabilities.

A disability expert highlighted the widespread use of battery-operated mobility aids like motorized tricycles to navigate outdoor spaces. However, indoor mobility—particularly in urban housing contexts such as flats and multi-storied buildings—remains significantly constrained due to narrow passages, staircases, and the absence of adaptive indoor mobility solutions. Although stair-climbing wheelchairs have been developed by Indian start-ups, uptake remains low due to high cost, limited awareness, and lack of user-friendly design. This underscores the need for user-centered research and design to develop affordable and contextually relevant indoor mobility solutions.

Feeling At Home: Use of Household Appliances

Household appliances were a key demand for electricity for people with disabilities. Their experiences were shaped by their impairments, bringing a mixture of challenges, and at times, unexpected benefits.

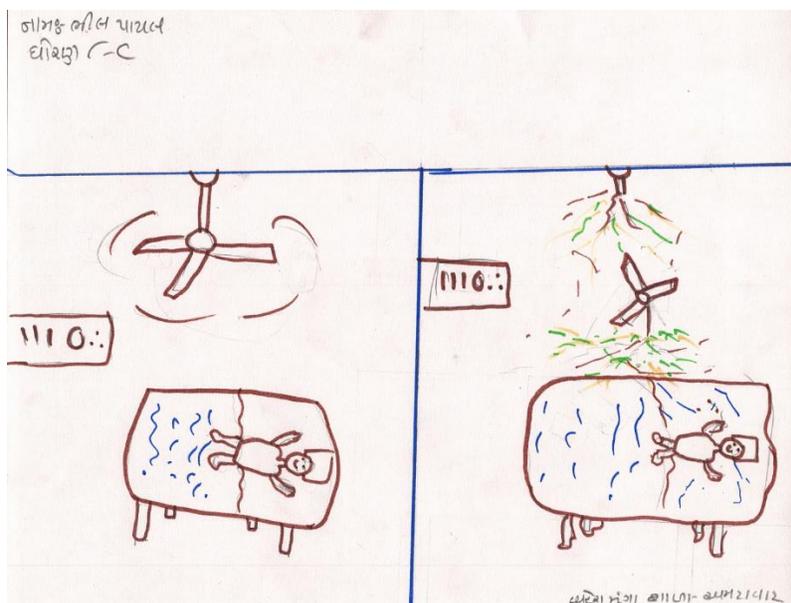


Figure 22: Drawing of fan use at home (Drawing © Payal Bhil)

Ms. Payal Bhil highlighted through her drawing how deafness creates unique safety challenges when using electrical appliances. She explained that while hearing individuals can detect malfunctions through auditory cues like unusual noises from fans or machines, deaf individuals remain unaware until a serious incident occurs. This vulnerability was further illustrated by another respondent's experience: her entirely deaf household had been using a faulty fan for some time without realizing its bearing issues. Only when visiting guests noticed and pointed out the abnormal noise could they call an electrician to fix the problem - narrowly avoiding a potential accident thanks to this chance intervention. This case underscores the critical need for accessible alert systems in household appliances to ensure safety for deaf individuals and families. Visual or vibrational warning mechanisms could help bridge this sensory gap and prevent dangerous situations.

Household appliances regularly used by people with disabilities also included refrigerators, air conditioners, and washing machines. Responsibilities for household chores largely fell on the shoulders of women with disabilities, even if they were married to a person with a disability. One woman with a disability who provided care for her husband describe how washing the clothes for five family members by hand would take her two hours daily. Recently, however, they purchased a washing machine, reducing the time and physical strain required for laundry to just 30–40 minutes. Over time, the couple has made practical investments in appliances to streamline household tasks. They purchased a refrigerator on EMI, allowing the woman to prepare meals in one go and store them safely for later consumption without spoilage.

PhotoVoice (Figure 23 and Figure 24) revealed the importance of appliances such as air conditioning to support people with disabilities who are often inside the home and unable to go out to be able to feel refreshed:



Figure 23: મારા જેવા લોકો કામ કરતા વખતે નાના બ્રેક લેવા માટે કાયમ બહાર આંટો મારવા કે ધુમ્રપાન કરવા નથી જઈ શકતા. જ્યારે હું વ્હીલચેર પર બેસીને સતત 8-9 કલાક કામ કરું છું ત્યારે એર-કંડિશનર મને ઓછી ગૂંગળામણ, ઓછો થાક અને વધુ તાજગી અનુભવવામાં મદદ કરે છે. "

(Translation: "People like us can't go outside to take a stroll or a quick smoke break while working. The air-conditioner helps me feel less suffocated, less exhausted and more refreshing when I am sitting on a wheelchair and working for 8-9 hours straight." (Photo © Rajviben Gosalia)



Figure 24: "गर्मी की वजह से फेन चालु किया है मैंने".

{Translation: "I turn the fan on because of the heat"} (Photo © Shaheen Parveen)

People who were deaf found unexpected benefits in the use of certain household appliances, as reflected through drawings: (Figure 25)

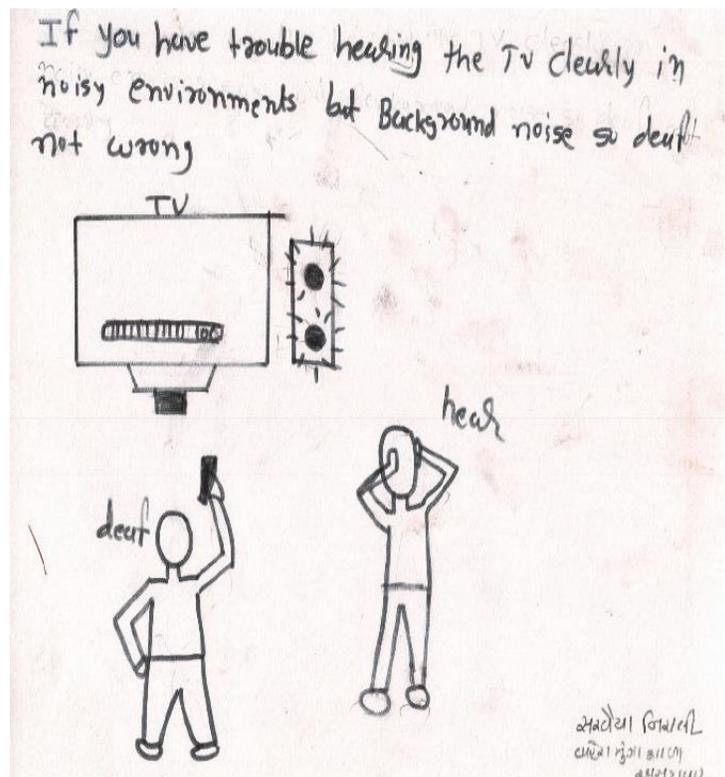


Figure 25: Drawing of experiences of watching TV for deaf people (Drawing © Nirali Sarvaiyya)

Nirali Sarvaiyya's drawing offers a compelling reframing of deafness, challenging conventional perceptions of disability. She presents deafness not as a limitation, but as possessing unique advantages in certain contexts. A striking example emerges in noisy environments - where blaring televisions, chaotic street sounds, and other auditory disturbances unsettle hearing individuals, deaf people remain undisturbed. This perspective highlights how sensory differences can create unexpected benefits, allowing Nirali and others in the deaf community to maintain focus and tranquility where others might experience stress or distraction. This insight aligns with the social model of disability, which distinguishes between impairment and the social/environmental barriers that create disability. Nirali's experience demonstrates how changing environments and perspectives can transform what society typically views as limitations into neutral or even advantageous differences.

Socio-Cultural Dimensions of Energy, Cooking and Disability

Socio-cultural factors played a significant role in shaping people with disabilities' energy access, management and use. **Who they were shaped what they did, how they felt, and how they accessed services.**

Gender and Disability Intersections

Energy access, disability, and gender intersect in complex and often invisible ways, and gender played a significant role in the experiences of people with disabilities, caregivers and experts.

Across nearly all households, women—especially mothers—emerged as the **primary managers of energy needs** and the sole caregivers for family members with disabilities. An urban planner reflected on the role of access to cooking fuels in improving the lives of women caregivers of people with disabilities:

“If you have a disabled person at home, much of the caregiving responsibility is going to fall on the woman.[...] So if you make her life a little easier by giving her better fuels, cooking, and all of this, it's going to make her life also easier, right? That's about it for the household, as well. Looking at, okay, supporting the person with disabilities means supporting the household. And moreover, supporting the mother or the sister.[...] Or the wife, right?” (Urban planner)

From sourcing LPG cylinders, adapting kitchens for wheelchair navigation, to manually carrying their children upstairs during outages, women’s labor in ensuring energy access was not only physical but deeply emotional:

“I don't just cook. I lift him, feed him, bathe him, and make sure the gas is full before he wakes up,” (Mother of a teenage boy with muscular dystrophy).

Moreover, the **mental load** of keeping track of electricity bill payments, arranging alternate cooking when LPG ran out, or navigating service providers for disconnections fell largely on women. Yet, **none of the respondents had been consulted** in any community-level energy decision-making processes.

Women were overwhelmingly more responsible than men for cooking, whether they were caregivers of people with disabilities or had disabilities themselves. As one woman said,

“You have to cook, no matter what impairment you have. If we refuse then it doesn't get cooked, so we have to cook.”

In one case, it was noted by a woman caregiver that her younger son and husband take on caregiving only when she is menstruating.

An urban planner reflected on the gender dimensions of cooking fuels and electricity as part of household energy demands:

“If you talk about electricity, also electricity is for the overall household, I think, because it impacts. But cooking fuel, it disproportionately impacts the woman. And it is a gendered role.[...] And it impacts her a lot. It also impacts her the time that she has to then invest in going and collecting wood for cooking. So it's taking economic, productive time away from her time, right?”

“And I guess the thing is that we don't know much about how it impacts those with disabilities. [...] It's compounded there, right?” (Urban planner)

A disability expert reflected on how kitchens are associated with women in India, and that as a woman 'has to' cook, it is 'unfortunate' that cooking is predominantly still associated with women, with more work needed to focus on gender equality:

"And in the kitchen, immediately in our country it is associated with women! Majorly! I'm not saying that men are not working in the kitchen, but with domestic work women are the supreme."

"I think there's a very interesting thing, certain you see, I might be a very good cook, as a male I'm saying, I might be an excellent chef in a famous restaurant or hotel. But when I go back home, I want to eat food that my wife has cooked. So that has not gone, actually. In my profession as a man, I can cook, but at home it's the same, it's just that with cooking I can get a respectable job. When he comes back home, he thinks cooking is a secondary job, and "that is not me because I am head of the family!", so cooking has to be done by a second person and that would be his wife. Fortunately, that's slowly changing. Now both husband and wife have started working, so things are changing. I see a very high hope." (Disability expert)

This expert reflected on a need to promote cooking as a "both (gender)" thing to encourage men including those with disabilities who may work as professional chefs to go into the kitchen at home and help their wives, and learn and have a passion for home cooking, because *"it's not rocket science, but there's also a need for passion to cook."* A physiotherapist also said that beyond financial limitations, there is also a deeply ingrained gender bias in household roles. No matter how many innovations enter the market to simplify tasks, kitchen work is still overwhelmingly expected to be a woman's responsibility. Even in households where neurotypical men are present, duties in the kitchen continue to fall upon women—often including those with physical disabilities—reinforcing the perception that managing domestic chores is inherently their obligation.

In one case of a couple who both had disabilities, whilst the wife was predominantly responsible for cooking, the husband took on part of the tasks including cutting up and preparing vegetables. Yet the wife spent 1-1.5 hours every morning preparing breakfast, made lunch tiffins, and cooking dinner. Over the years, the husband having an accident reduced his ability to contribute to household duties and cooking, even though they were already limited beforehand as it was felt that his responsibilities should be focused on financial contributions to the household. The wife often wonders why household chores continue to fall disproportionately on women. She questions the lack of balance and shared responsibility within families. With this in mind, she ensures that her son learns the same household tasks she teaches her daughters, reinforcing the idea that domestic work should not be tied to gender.

Men and boys with disabilities overall however rarely stepped into the kitchen, if at all, because the women in their families, wives, mums and sisters, were managing the cooking. Some men with disabilities had not been into the kitchen at all, because their mums were managing it and according to one Deaf and Mute man, he *"doesn't need to learn anything about it"*. In contrast, however, one caregiver felt that basic cooking skills were for everyone, and that teaching her son cooking skills would not only prepare him to be more independent when the family isn't around but also ensure that she feels supported as she grows older. She explained that since her elder daughter is likely to

marry and move away, her son's ability to manage small tasks in the kitchen will be a source of help and reassurance for her in the future.

Some men with disabilities did not cook at the time of the study, but had cooked in childhood. As one man reflected through his storytelling, he had to *use a 'Koile ki Angithe (Fireplace made by Coal)'* for cooking back then. He needed to add sand and oil to get it working. *"Raakh niche girti thi tu usko kheeche lete the aur jalaate the!" (The ashes would fall down, we would pick them up and burn them again)*. He made khichdi, dalia, and Rotis as well as he could on it and fed his family with that. He used to head to the jungle to pick up usable sticks for the fire. In other words, his wife does not let him help with cooking and he is comfortable with the arrangement.

Women with disabilities faced **additional barriers**. For instance, a visually impaired woman shared that her household did not allow her near the gas stove due to safety concerns, despite her willingness to cook:

"They say I'll hurt myself, but no one thought of giving me adapted tools or talking to me about it." (Visually impaired woman)

This reflects a **gender-disability double burden**—where patriarchal norms and ableist assumptions converge to limit agency, autonomy, and energy access. At the same time, an expert in supporting blind people stated that expectations continue to favor blind men over blind women. A blind man marrying a sighted woman, while uncommon, is socially acceptable. In contrast, a blind woman is typically married to a blind man. In many cases, if she marries a sighted man, he may have another form of disability. Thus, blind women face compounded discrimination, with their acceptance in familial and societal structures being conditional and limited.

Experiences of cooking and energy use were shaped by family mindsets, and how men and boys were treated differently to women and girls. One mother had taught her deaf and mute daughter to cook, yet, her perspective shifted noticeably when asked whether she would have raised her son the same way if he had been deaf and mute. She stated that, in such a case, she would have encouraged him to find a job or start a business. However, when asked why she does not do the same for her daughter, she explains that she does not go out on her own. She further clarifies that the family is hesitant to let her go out alone due to safety concerns. Context for these experiences were given by one psychologist in Ahmedabad, who explained that there remains a tendency among society to hide disabilities, especially among girls, reinforcing stigma and isolation. While not deeply explored, the psychologist alluded to the fact that girls with disabilities often face greater social stigma and protective restrictions, limiting their exposure and independent growth.

Cultural beliefs deeply influence disability perceptions and practices. One expert from an NGO shared how her own father once believed her brother was a *"gift from God meant to be served,"* leading to complete dependence rather than empowerment. She reflected that such mindsets, common in rural Gujarat, perpetuate dependency and inhibit skill development.

A distinct **gender bias** also emerged: parents of girls are often eager for their daughters to learn practical skills like cooking, fearing marriageability or domestic expectations. Parents of boys, however, rarely express the same concern for life skills, creating gaps in their future independence:

"Often, parents of girls ask that they learn cooking skills, while parents of boys do not express such expectations."(NGO expert)

One NGO expert stressed that regardless of gender, every child must be given the opportunity to acquire essential life skills to live with dignity and self-reliance.

Gender shaped education about cooking and in general. One caregiver said that she enrolled her disabled daughter into a certain school because she did not feel her daughter would have the same sense of safety if she was in an institution with other adult men. A design expert offered reflections on design education. The expert critiqued the portrayal of gender roles in educational materials (e.g., "mummy cooks, papa goes to office") and advocates for more gender-neutral and inclusive representation in textbooks and design thinking. She pointed out that domestic roles, such as cooking, are often assigned to women—even among individuals with disabilities—reflecting broader societal gender biases. The design expert advocated for inclusive representations.

"In textbooks, if you show 'mummy cooks, papa goes to office,' then that stereotype becomes ingrained."

"Even for disabled individuals, cooking is culturally assigned to women. That bias persists." (Design expert)

Gender roles shape exposure and training. Cooking is still seen as a female task, while boys are not encouraged to learn:

"Not just girls, even boys should be taught how to cook... basic cooking should be taught." (Disability expert)

Due to traditional mindsets, disability experts stated how cooking-related gender roles are deeply ingrained, making behavioral change slow. While not explicitly addressed, one expert at a Deaf and Mute school highlighted that gender equity issues emerge implicitly in vocational training opportunities and societal expectations surrounding disability.

An expert who worked at an NGO center referred to parental resistance. Parents may resist teaching boys kitchen skills, but the center actively challenges these norms through videos and homework assignments (e.g., filling water bottles, dusting), and by demonstrating the benefits of skill sharing to parents. Both boys and girls are taught kitchen skills at the center to promote independence. The center avoids direct intervention in cultural norms, opting for a slow, persuasive approach. It was noted that government schemes see more male beneficiaries (e.g., vocational kits), reflecting societal preferences. Another institution also followed a similar program:

"In urban cities, perspectives have evolved, and cooking is no longer viewed as a strictly gendered activity. At our center, we ensure that visually challenged individuals—regardless of gender—receive

equal opportunities to learn how to cook. However, broader societal norms still reinforce the idea that women bear the primary responsibility. More often than not, they end up with the short end of the stick— expected to shoulder the burden of kitchen duties regardless of circumstances.” (Professional supporting people with visual impairments)

Other experts also highlighted the need for gender neutrality in the early stages of education for people with disabilities within institutes, particularly when teaching early life skills like hygiene and activities of daily living in the institute. This reflects a focus on developmental priorities over societal roles. While not explicitly stated, it can be inferred that domestic skills like cooking may eventually be emphasized more for girls, but only after foundational readiness is achieved.

From a societal perspective, there is a noticeable gender bias in how skills and knowledge are encouraged. Regardless of an individual’s condition, boys are often urged to learn and operate technology because they are expected to participate in the workforce and provide for their families. Meanwhile, girls are often overlooked in this regard, as the prevailing belief is that they will primarily remain at home, making technical skills seem unnecessary for them. This mindset can significantly limit women, sometimes disregarding their own aspirations and interests. Families hesitate to let women step out due to concerns about safety, capability, and societal expectations. The difference in approach is stark—boys are told, *'Learn this, it will help you in the future,'* while girls are dismissed with, *'What is the need for you to learn this anyway?'* However, it was emphasized that knowledge and skills should not be restricted based on gender. They are universally valuable and serve a purpose for everyone, regardless of societal roles. Ensuring equal access to learning empowers individuals to make informed choices about their futures.

Gendered patterns of awareness and access to assistive aids were observed by professionals in the disability sector. Male beneficiaries tended to seek support earlier, likely due to greater mobility and information access. Women beneficiaries, especially those receiving mobility aids like motorized tricycles, reported enhanced self-reliance and reduced dependency on others, particularly male family members. This demonstrates the empowering potential of assistive technology in addressing gender-specific barriers to mobility and independence.



Figure 26: Drawing of energy aspirations for a man with hearing impairments (Drawing © Hirenchai Barad)

Gender norms were also vivid through drawings. Hirenchai Barad, who has hearing impairment, acknowledges limited engagement with cooking activities. While he self-reports minimal awareness of practical kitchen challenges, his conceptual drawing reveals aspirational elements - including a fan, microwave, and chair - suggesting comfort-focused rather than accessibility-driven priorities. This aligns with a broader pattern observed among male respondents, whose representations frequently emphasize convenience features over functional adaptations, reflecting greater reliance on spousal or familial support for meal preparation. Notably, his kitchen visualization bears striking resemblance to office spaces, potentially indicating how limited direct cooking experience shapes perceptions of kitchen design.

The data reveals a critical disconnect between expressed needs and lived experiences, particularly along gendered lines. Male respondents, whose engagement with kitchen labour is often limited by traditional domestic roles, tend to prioritize comfort-oriented features (e.g., fans, recliners) in their designs, reflecting a privileging of convenience over accessibility. This contrasts sharply with female participants' focus on practical adaptations for daily tasks. The pattern suggests that physical distance from cooking labour manifests conceptually male drawings often resemble office spaces rather than functional kitchens, underscoring how limited hands-on experience shapes perceptions of need. At a systemic level, these disparities perpetuate dependency dynamics, as designs informed by hypothetical rather than experiential needs risk overlooking the realities of those who primarily manage household labour. Ultimately, the findings expose how entrenched

gender roles can skew design imaginations toward aspirational solutions while marginalizing the urgent, embodied knowledge of primary users.

Dynamics in the Home Environment

Family dynamics at home shaped experiences of energy use and cooking for people with disabilities in Ahmedabad. One man noted how whilst he was not included in cooking when he was younger, his family support was strong whenever he needed help to this day to meet his energy needs. Dynamics at home also meant that cooking responsibilities were shared between women with disabilities and other female members of the family such as their mother or mother-in-law, as shared through a story-telling by a high-income woman who lost her arm in an accident:

“Today, I can cook food based on the preferences of each member of my household. Yes, sometimes I still need help from my mother-in-law, but I feel deeply satisfied knowing I’ve fulfilled all my responsibilities. I never let my one hand become an excuse.” (High-income woman with orthopedic disability)

One woman with a disability had been widowed, but previously her husband who had low vision would cook everything that she used to. This woman taught and passed on her cooking skills to her daughter.

People with disabilities such as visual and hearing impairments also raised concerns about marriage prospects. A woman who was blind said that she was concerned that if she married someone regular while being blind herself, she would run into issues, so with the help of a friend she found a partner closer to her criteria. After marriage, with the help of more open folks around her and resources like YouTube guides she learned to cook at a higher level. She is confident she could cook for 100- 150 people now if needed.

A key theme emerged around overprotectiveness. A woman who was deaf took on the bulk of cooking responsibilities at home, because her family and in particular her dad does not let her go out due to safety concerns and voice opposition against it. Her mother admitted that her daughter does express a desire to go out frequently, as she gets bored staying at home. Despite this, the family’s fears prevail, with her mother concluding that they choose to restrict her movement because *‘samay bau kharab che’—times are bad*. Design and disability experts interviewed also reflected on overprotectiveness as hindering the independence of people with disabilities and their ability to cook. Cultural norms often lead to overprotection of disabled family members with tasks being done for them, inadvertently limiting their independence instead of enabling them. A design expert critiqued entrenched gender roles that restrict men from engaging in tasks like cooking, thereby deepening the functional divide in caregiving.

“Families often do things for disabled members instead of enabling them. That overprotection reduces independence.” (Design expert)

Overprotection together with cultural stigma hindered independence. Families in both low-income and affluent strata inadvertently hinder autonomy—either due to shame or overpampering. A disability expert reflected on how girls with disabilities are especially restricted in middle-class families, while children from low-income groups are often hidden due to social shame or economic pressures:

"You don't allow the girl to be exposed... don't tell anyone my daughter has poor vision."

"I have seen children as big as 10 and 12 being fed by their mothers... this is over-pampering."

(Disability expert)

Another disability expert highlighted overprotection as a barrier to energy use. In India, traditional families tend to see the child as permanently dependent, delaying life skill instruction like dressing or brushing—let alone using energy-dependent tools.

Disability-based Discrimination

People with disabilities in Ahmedabad faced discrimination. Visually impaired women were at times prevented from cooking due to family fears about their safety and face judgment from others about whether they could cook:

"One of the things we can face is discrimination. People make a judgement about whether you can or can't do something before knowing you. But you know that if the pressure cooker is on, the whistles will start to blow when the water starts to decrease, you know that the whistle is definitely going to blow." (Visually impaired woman)

One caregiver kept her deaf and mute daughter at home from the 10th grade onwards, and began teaching her cooking and household chores. Since then, her daughter has been learning to cook and manage the household. She gives a layered statement when asked further about it and says *"What else can she do otherwise anyway"*. This suggests a sense of practicality but also, perhaps resignation about the limited opportunities available to her deaf daughter. It reflects a mindset shaped by circumstances—likely societal expectations, accessibility challenges, and personal realities. There are multiple ways to interpret this caregiver's statement, and her perspective is shaped by her experiences and beliefs. She may feel that her daughter is not capable of much beyond household responsibilities, which could reflect deep-seated ideas about what is expected of women, particularly in traditional settings. Her statement could also be a reflection of resignation—perhaps she believes that even if her daughter wanted to do more, structural barriers, accessibility issues, or a lack of opportunities would prevent her from pursuing anything beyond domestic work. It might not be just about the deaf and mute woman's abilities but rather her mother's understanding of the broader world and how much space it truly allows for individuals like her daughter to explore possibilities. One expert at a deaf and mute school gave context for this resistance to change, as deep-rooted societal attitudes continue to hinder progress toward meaningful inclusion of hearing-impaired individuals.

Discrimination against people with disabilities was not universal. A woman with a visual impairment shared through a story that aside from her father's worries while young, she has not run into much stigma or oppressive stereotyping that prevented her from cooking. She has cooked for her in laws since day one. Even on big occasions at the house, she has managed to cook for everyone. Her *jeth* (big brother-in-law) is very approving and says that even though she can't see she cooks better than her *jethani* (brother-in-law's wife).

Social isolation of people with disabilities stems from discrimination against them. One expert noted that social challenges such as miscommunication and exclusion reduce opportunities for children with intellectual disabilities to engage in shared tasks involving energy use, such as classroom cooking sessions or group projects. A director of a disability NGO recalled how observing a child with a disability being isolated in a room prompted the startup of cooking activities at the NGO's center:

"We had gone to, I still remember it, we went to the first child's home, because [NGO] also visited the homes. At that time it was one room, kitchen, everything was in one room. Very small, like a 10 x 12 or a 10 x 15 (ft). But one place, it had two rooms. So we thought the child was going to that room, she locked herself. We came to know that the child was actually forced and told to go to that room. The reason was that the child was not behaving well- according to the family. They were removing clothes, they were not properly dressed, lots of things were happening. So according to the family they were "unsocialized". So we went in thinking "well, what if it is about how to socialize in the community?" So I start with the family." (NGO Director)

The discrimination faced by people with disabilities in Ahmedabad reflects wider cultural and societal barriers to their meaningful participation in cooking.

Structural Inequities

An expert involved in supporting blind people in Ahmedabad noted how structural inequities play a role in energy access and people with disabilities. As per older data (2011 Census), only 5–10% of blind individuals pursue higher education, and less than 1% of women with visual impairments are represented in decision-making roles. The situation points toward systemic exclusion, starting from lack of access to education, to limited livelihood opportunities. Poverty, gender bias, and inaccessibility continue to define their experiences of energy use and cooking.

Independence of PWDs

Strength in One Hand: Meghna's Journey to Independence and Dignity

“
Everything is possible if you don't give up without trying.
”



A Turning Point

At age 26, Meghna Parikh's life changed dramatically. A devastating accident led to the amputation of her arm. The journey that followed required not only physical healing but also emotional strength and a complete relearning of daily tasks - just like a child learns for the first time.

Relearning Life

"I didn't want my family to struggle for food. - I was determined to cook for them myself."
With practice and patience, she learned to make rotis, bhakhris, puris and parathas using just one hand. From kitchen gadgets and lighting the stove with a fixed matchbox - she adapted everything.

Entrepreneurial Spirit

Beyond Household duties, Meghna took on her father's insurance work and started a home-based business selling spices, wafers, and organic mangoes. Today, she is known as 'The Spice and Mango Lady' in Maninagar area of Ahmedabad.

Support Systems

- Family encouragement became an emotional pillar.
- Personal willpower drove her reclaim her life.

Her Call to Action

"We don't need pity. We need infrastructure that works for us. - like gas pipelines, accessible appliances, and proper information about our rights."

Disability—whether from birth or acquired—can change lives, but resilience, family support, and opportunity can rebuild them.

Strength Within: A life of Independence for Arunaben

“
Even if you find yourself alone in life, you must have the strength within to keep going.
”



A Father's Lesson

From childhood, her father taught her that strength comes from within. Though she struggled with basic movements, his persistence helped her gain independence—one step at a time.

Her First Attempt at Cooking

At 12, with her mother away, she cooked for her siblings and father for the first time. The rotis were imperfect, but the curry turned out well – and the joy of cooking stuck with her ever since. Today, she can peel, chop, stir, and prepare entire meals, even if kneading dough remains difficult.

Everyday Barriers + Quiet Solutions

She's adapted her kitchen for sitting work and uses a simple gas stove – though she's cautious with lighting and gas usage. High switchboards are out of reach, and travel is limited due to the lack of suitable mobility aids. Still, she manages her expenses through her pension, saves where she can, and uses her mobile phone to stay connected.

Her Call to Action

A simple change, like placing electric switchboards at a lower height, could make everyday life easier for many.

Independence shouldn't require overcoming barriers – it should be built in.

Striving for independence enabled people with disabilities to cater for their own needs themselves:

*"Perhaps I may not be able to stand on my feet, but I am **independent**—and that gives me satisfaction. I live alone in Ahmedabad and manage all my expenses by myself. Of course, this journey wasn't easy. Many struggles came my way—some natural, some man-made—but my unshakable determination has brought me to where I am today."* (Woman with polio)

Independence for some women came through moving to Ahmedabad from other parts of Gujarat. After overcoming the hurdles of getting consent from their families to move to the city, cooking became a part of their independent lives and their progress and ability to 'move forward'. As a

disability expert aptly summarized, *"Mobility is the first step to economic rehabilitation. If we solve this, other challenges become manageable."*

Some women with disabilities made sure that they cooked, whether somebody was at home or not, to cater for their own needs. Meanwhile, some men with disabilities wished they were able to do more for themselves, acknowledging that without help they would not be able to contribute to cooking and other tasks.

A psychologist provided key insights into the impact of economic class on the independence of people with disabilities and their development of cooking skills. Affluent families tend to overprotect children with disabilities, providing excessive support that impedes independent skill development:

"Excessive support from wealthier families deprives children of the opportunity to learn life skills."
(Psychologist)

In contrast, families from middle and lower classes tend to foster resilience and adaptability as children integrate with peers in mainstream schools from an early age. One disability expert's personal effort as a caregiver for her brother offer a compelling model. By setting clear expectations, providing guidance, and allowing supervised trial and error, her brother gradually learned to eat independently, clean utensils, and manage personal belongings. She emphasized the importance of **patient insistence** and **structured autonomy** in helping people with disabilities achieve independence. She firmly believes that protection must not come at the cost of opportunity, and that the ultimate gift to a person with disability is the ability to stand on their own feet.

One health care expert noted that as part of facilitating independence in cooking and beyond, her organization consistently counsels parents to help them accept their child's circumstances and explore avenues for assistance. One woman with a disability said that without her father teaching her to face challenges head on from an early age, she would not have been able to cook now as an adult. Providing access to government support and resources ensures that these children receive the best possible care and opportunities.

Professionals highlighted through interviews that the independence of people with disabilities with regard to cooking is multi-dimensional. Whilst people with disabilities may perceive themselves as self-sufficient, there are costs associated with it. An expert involved in supporting people with visual impairments explained that blind individuals, particularly women, often develop an extraordinary capacity for self-adjustment in the kitchen, relying heavily on touch, smell, and sound in place of sight. Over time, many take pride in their ability to manage tasks independently, even in the absence of assistive technologies or safety modifications. While this resilience is commendable, it often comes at a physical and emotional cost. The repeated burns on fingers, especially during high-heat tasks like frying or making *Rotis* and *Puris*, become normalized as part of the routine. Yet, this silent suffering is rarely spoken about. Many blind persons internalize the belief that seeking help or demanding better tools signals weakness. This over-adaptation masks their daily risks and inadvertently reinforces societal neglect, as it allows systemic inaccessibility to remain unchallenged.

While government schemes and NGO programs have sought to support the blind community through assistive devices, income generation support, skill development training, and monetary aid, a significant unintended consequence has been the cultivation of dependency. Free handouts—whether in the form of talking watches, mobility canes, or small stipends—often become ends in themselves, rather than part of a broader, empowering ecosystem. Even when skill-building or entrepreneurship support is provided, the lack of consistent job opportunities and the absence of start-up capital or market linkages make it difficult for many to sustain a business or secure stable income. Consequently, despite having skills, many visually impaired individuals remain underutilized or fall back into dependency. The charity model, rather than enabling upward mobility, often becomes a ceiling. Over time, this can erode self-confidence and limit aspirations, especially among young blind individuals who grow up receiving assistance but are rarely encouraged—or equipped—to push beyond it. What begins as support can silently morph into a systemic barrier to empowerment, unless accompanied by pathways that foster ownership, financial independence, and meaningful inclusion in the mainstream economy.

Blind persons—especially women—navigate a world that is physically, socially, economically, and technologically unaccommodating. From cooking in unsafe kitchens with burn-scarred fingers to navigating restrictive social roles and exploitative family dynamics, their lives are marked by constant self-adjustment and resilience, often mistaken as empowerment. While technological solutions and skill development programs exist, these are undermined by systemic barriers such as affordability, inaccessibility, and lack of sustained opportunities. Moreover, the over-reliance on charity-driven models and sporadic income-generation support fails to address long-term empowerment, often reinforcing dependency and diminishing ambition. Gender further compounds this exclusion, with blind women facing extreme limitations on mobility, decision-making, and control over their own earnings. A rights-based approach that prioritizes universal design, accessible infrastructure, inclusive technology, gender equity, and economic agency is not just essential—it is urgent. Only then can energy access and usage become true enablers of dignity, autonomy, and self-determined futures for the blind community.

From the Classroom to the Kitchen: Education, Teaching and Learning

Education, teaching, and learning impacted the cooking experiences of people with disabilities in Ahmedabad. People with disabilities had varied experiences of education, including: starting school at a later age than others; going to either a school for children with disabilities or a mainstream school; leaving school at an early age; studying until the 12th grade; and, taking on vocational training in adult life. Some people with disabilities were only able to start schooling, albeit later than others, due to encouragement of their parents by neighbors who were aware of relevant opportunities for children with disabilities, and schools in which they could easily acclimatize. Although they started school later, a minority of the people with disabilities were able to progress and reach higher education. Some people who were deaf and mute did not have appropriate communication support such as sign language interpreters in mainstream schooling, only being able to learn by copying notes. A lack of interpretation support had a significant negative impact on the experiences of deaf people at school, limiting their progress. For some deaf and mute participants, although they attended a special Deaf and Mute school, education was only offered

until the 10th grade. Yet, access to technology had begun to enhance these learning experiences, through ‘smart class technology’ which in combination with sign language, enabled both visual engagement and linguistic accessibility. Skill-building courses for people with hearing impairments were available at a foundation in Ahmedabad which were appealing to deaf participants due to the incorporation of advanced technology for teaching.

Professionals provided context for the ways in which people with disabilities learn in general, which can impact how they learn to cook. A professional at a Deaf and Mute school explained that the majority of hearing-impaired students fail to complete secondary education due to language acquisition difficulties, severely limiting future opportunities. A psychologist highlighted the need for a shift in learning dynamics. Traditional manual learning methods have limitations; children only learn rote activities. The introduction of technology enables experiential learning, critical thinking, and broader cognitive development in terms of developing a range of skills including cooking:

"Previously, children learned only what was taught manually. Today, with apps, they explore, think, and respond independently." (Psychologist)

Professionals drew attention to the need for different accessibility measures to teach children and adults with disabilities how to cook. For regional and linguistic relevance, tools and applications must align with the child's linguistic and cultural context to ensure real-world applicability and connection. Customized solutions are also needed. App usage should be tailored to specific disabilities and their severity. For Vi users, tools that convert images to voice outputs offer critical accessibility support. As one expert summarized:

"Applications must match the child's environment and language to truly make learning meaningful." (Psychologist)

A woman working with children with disabilities at an NGO highlighted how **energy-enabled tools**—especially *audio-visual media*—help children build cognitive connections with the real world. By using practical exercises such as showing a bird's photo and then playing its sound, she enhances children's ability to associate images with sounds, thus bridging the sensory and cognitive gap. This approach extends beyond classroom settings. At home too, she uses similar methods with her brother, illustrating the wide applicability of such tools for learning and social integration.

"Through audio and video, we engage children in various activities to familiarize them with their surroundings." (NGO-based educator)

By gradually exposing children to real-world cues using energy-driven tools, she believes technology acts as an equalizer — enabling children with special needs to interact with and interpret their surroundings more confidently. The need for people with disabilities to have some degree of digital literacy was clear. A woman with an orthopedic disability highlighted how the fact that she was using a computer was important for her future, and that there was a need for people with disabilities to want to learn and that the opportunities for them, especially in rural areas, to do so needed to be available:

"I don't have a laptop at the moment but I use a computer for my design work. And my mobile phone, I use both. Eventually when I get a job, it will be one that involves using a computer. This is good for my career that I am able to use one. I can think about more career options because I can use a computer."
(Woman with orthopedic disability)

Gaps in digital literacy however remain. Many blind students lack character visualization due to overreliance on Braille. Digital formatting skills, like bolding text or understanding font types, are often not taught effectively. Technology usage is therefore often reduced to consumption, not creation, due to poor foundational teaching.

"Writing A is not a big thing... but they don't have the idea because no one ever showed them how A is formed."

"Technology is not just opening and closing a file... formatting, spacing, bold text—these all matter."
(Disability expert)

Some parents felt that technology was not always the answer to teaching. One mother was uncertain about how much technology could help her daughter to learn, because she could not read or write. She also faced the challenge of commuting long distances to her daughter's education foundation, yet has continued with it because she has trust and confidence in the foundation, and knows her daughter is in a secure environment.

One government worker shared how together with family engagement, Teaching-Learning Materials (TLM) kits issued by the government for children with intellectual disabilities—comprising puzzles, toys, books, and ADL (Activities of Daily Living) materials—serve as significant learning aids. Often, siblings engage with these materials first, gradually drawing the child with a disability into the activity. This sibling-mediated engagement strengthens not only the learning experience but also social bonding within the family, reinforcing the value of inclusive learning environments at home.

In contexts where such toys and educational materials are otherwise unaffordable, TLMs become shared learning tools within the household and neighborhood. Even when children with disabilities do not actively engage with every material, observation of sibling or peer interaction facilitates passive learning. These shared spaces also promote interaction with non-disabled peers, encouraging inclusive community-level socialization.

Given the frequency of use by multiple children, wear and tear on TLMs often occurs well before the standard three-year replacement period. This suggests a need to reassess material durability standards and consider more frequent or need-based replacement cycles to ensure continued effectiveness.

Inclusive education systems are needed for people with disabilities to learn to cook and pick up other life skills, and to progress academically. One disability expert reflected on the state-level context for education for people with disabilities. Gujarat has robust support (e.g., Braille materials, apps), but subject-specific barriers persist (e.g., STEM for visually impaired). Therefore, parent and

sibling involvement is critical for intellectual disability training. One organization was making efforts towards inclusive education through their model classrooms, which integrate deaf, blind, and non-disabled students.

For some people with disabilities, education included vocational skills. For one blind woman, alongside her regular studies, she also learned handicrafts such as basket weaving, making doormats. She used to give presentations on how braille is learned and used during school events at an event stall, alongside selling school products. This woman taught herself how to cook and was enthusiastic about learning, and was frustrated whenever told she could not learn something and was adamant about not letting her blindness define what she could and could not learn. When home for vacation, she would stand next to her mother while she cooked and learned whatever she could. Her parents both had jobs, so when alone at home in the afternoons she would ignore any food, they cooked and try to make her own instead so she did not have to deal with her father worrying about the varied ways she might end up burned.

For people with disabilities originally from rural areas of Gujarat, learning to cook was a family affair and about getting involved, despite the challenges faced by them:

“My dad taught me more to cook than my mum. He was passionate about this and thought that there would be no issue, and I can do this. We are Brahmin, so it’s about getting involved and giving things, so there was always cooking to be done, and my dad was always involved. So along with my dad, I also got involved in cooking.”

“In the villages, things like using open stoves cause difficulties, but we have been using gas from the start. There is a significant difference between using gas and using the open fire stove. The people in the villages face a lot of challenges, you have to orientate them and teach them properly on using gas and the components. If you have put something in the pot it is important to know if something has cooked properly or not. This is one of the biggest challenges with cooking.” (Woman with visual impairment)

Women who had acquired a disability faced the prospect of relearning how to cook. As a woman who had lost an arm in an accident described in her story,

“Learning to make Rotis felt like being a 6 or 7-year-old child again. The shapes would come out all wrong initially, but with practice, not only did I learn to make Rotis, I also mastered making Bhakhris, parathas, Puris, and more with one hand. Now, I can even serve fresh Rotis to five or six people at once.

Cutting vegetables was a bigger challenge—especially peeling them. Even today, I can’t peel certain vegetables by myself. My mother-in-law helps me with that. Holding the vegetable and peeling it with one hand is difficult. If there were a machine to help with that, it would be a great support. For chopping other vegetables, I use cutters and similar tools which make the task manageable.

I also practiced using different kitchen appliances and gradually learned to operate them all with one hand.” (Woman with orthopedic disability)

Another caregiver described how her deaf and mute daughter learned how to cook primarily by observing her from a young age. According to this caregiver, her daughter has surpassed her in cooking and can prepare a wide variety of dishes—including *dosa*, *idli*, *halwa*, and *pakora*—with ease.

Traditional Kitchen Design, Cooking Techniques and Cuisine

Kitchen design in Gujarat shaped people with disabilities' experiences of cooking. Traditional Gujarati kitchens are at floor level in many homes, particularly in rural parts but also as observed in this research, in some parts of Ahmedabad. This brought both advantages and disadvantages to people with disabilities. The stories gathered through this research identified that kitchens which were traditionally floor-level now have "modern" designs that have various implications for people with disabilities. For some, the traditional floor-level kitchen was advantageous (Figure 27) because they needed to sit down and cook.

"I have never seen other people who have to sit down cooking, so I don't know. In the old times kitchens were always on the floor, it's nowadays that the kitchens are higher up." (Woman with orthopedic disability)



Figure 27: “અમારે ઘરમાં બેઠું રસોડું છે એટલે થોડી વસ્તુઓ જો આજુ બાજુમાં લઈને બેસું તો ખાવાનું બનાવાનું સરળ પડે.”

{Translation: We have a sitting kitchen in the house. So, if I take a few things with me while sitting, it makes the process of cooking a little easier. (Photo © Rekhaben Rawal)}

A design expert emphasized that kitchen design for people with disabilities must reflect cultural practices which vary and are context specific. For example, floor-level cooking prevalent in rural

India cannot be accessed by conventional wheelchair designs, highlighting the need for context-aware innovation:

“Kitchen habits vary. In villages, cooking is done at floor level. A wheelchair can’t function there.”
(Design expert)

The culture around cooking techniques in Gujarat also mattered significantly in enabling NGOs to support families to meet the dietary requirements of people with disabilities in poorer households. A director of a disability NGO in Ahmedabad described how their needs-based approach to improve the nutrition of children with disabilities was intrinsically shaped by the Gujarati culture in the area, with the aim of making gradual change embedded in culture:

“The needs came from the families in the community that “you teach us how to do something at home. What you are doing here is really effective”. For example, here in India you have the tadka, where you put the oil, cumin seeds, mustard, all these things, but we don’t know the reason. It has a very solid reason. We were introduced to Ayurvedic people as a dietician, so they told us why the tadka is important in all Indian curries. They didn’t do it earlier, they were putting coriander, everything, all kinds of things. But now, they do it with a logic in a sense. So, we don’t tell the community or parents, we see whatever they’re doing and just make a small change. And there are lots of experts called Virudhaar, these are things that we got because we are not experts in these things, so we got these experts who could talk in dialogue with the community. And they don’t tell those who are vegetarian or non-vegetarian ‘you should change your diet’. So just some small shift could take place.” (NGO Director)

Cultures around preparing masalas mattered, as one couple who both had disabilities and cared for each other explained. To aid in cooking, they acquired a mixer, which helps the wife prepare fresh *khada masala* (whole spices) for her meals. While these spices are easily available in stores, the family prefers the taste of homemade blends. Before buying the mixer, both the wife and the husband used a pestle and mortar for grinding spices—a time-consuming process that takes an hour to achieve a fine paste. Even now, the husband enjoys the richer flavor of traditionally prepared spices and prefers using the pestle and mortar on Sundays when they have more time. By contrast, the mixer reduces this process to just five minutes, making daily cooking far more efficient. Whilst technologies are emerging to support people with disabilities to cook, there is a clear need to recognize the importance of traditional cooking methods to them. Accessibility can only be achieved in cooking for people with disabilities with technologies only to a certain extent, and local cultures will always play a key role.

Urban-Rural Cultural Divide

The urban-rural cultural divide in India was highlighted as a factor which shaped how people with disabilities engaged with cooking and food generally. An interesting observation was made by the director of a disability organization: packaging culture was seen to be on the rise in rural parts of the country and in urban slums where rural migrants live, which was very cheap and of lower quality, whereas there was a rise in cooking at home in urban areas, across households including

people with or without disabilities. The director reflected how this was an emerging phenomenon in recent times which was likely to shape cooking for people with disabilities in India in the future.

As a growing city with many migrants, the NGO director highlighted how people with disabilities in the slums of Ahmedabad were likely to be cooking food in the way that they would in rural areas. The NGO's,

“Focus is mainly on the urban slums of Ahmedabad, partly because it doesn't make much difference and we say in terms of rural, 'one lane goes there'. In Ahmedabad and Gujarat, one word that is popular is vaas, a particular community living in that area. Then we've got maholla, which again is a different kind of community living there, then the third is the chaalis, you've got the migrant community living there. When you go to each maholla, vaas or chaali, then you go to the next maholla, vaas or chali, you find a different community. They bring their whole village, people come to that place, and they bring their culture also. In terms of the food. If you go to that maholla or chaali you get a particular kind of food they are eating because they are rooted in the village, from there they come here. So yes [the NGO's] focus is on urban slum areas, but we are very much aware thanks to these community people who have taught us how village, urban village, rural village works actually. Rural India's mentality, the culture, you can go there and spend time but when you come home, you're eating always what you eat in the village. Even if you're in an urban area. For example, khichdi is a very common meal in the evenings, and also chili, no matter what that will be served. You may be living in that slum or that area, but the food will not change.” (NGO Director)

Socio-Economic Dimensions of Energy, Cooking and Disability-

For many persons with disabilities, managing household energy is not just about utility bills—it's a daily negotiation with risk, memory, and financial strain. One woman's admission lays it bare:

“I use more gas than I should—sometimes I forget to turn it off. And cylinders are expensive. So, I stay alert, but I know others like me must struggle too.”

Her words capture a quiet, pervasive anxiety among disabled women: the intersection of rising energy costs, inaccessible kitchens, and the very real fear of accidents. This isn't just about convenience—it's about survival in spaces never designed for them.

For working-class families, energy use is equally fraught. A couple with disabilities working in tailoring, saw their electricity bill double after buying a refrigerator—a necessity, not a luxury, as one person explained:

“Now we pay ₹800–900 (approx \$9-10) a month, [...] But what choice do we have?”

In cities where every rupee counts, the trade-off between safety and affordability falls hardest on disabled households. The question is not just *how* they cook, but *whether* they can do so without sacrifice.

Employment, Income, and the Myth of “Mercy”

Economic independence for PwDs isn't a linear journey—it's a grind against skepticism, infrastructure failures, and systemic undervaluation. One man's story says it all: after five years mastering tailoring, clients still dismissed him.

“They'd ask me to fetch water instead. Once, I worked three months for one rupee. Even later, I earned half the usual wage—koi rehem wali cheez nahi thi.” (Man with orthopedic disability)

His shift to electric machines came with blood and grit:

“The machine mangled my fingers. But now, with speed-controlled software, it's safer. I'd never go back.” (Man with orthopedic disability)

One woman refused pity, and built a life through online work, covering rent, food, and bills on her own terms:

“Disability doesn't entitle me to a job—I fought for independence.”

A woman with an orthopedic impairment found entrepreneurial opportunities close to home:

“I started a home business selling spices, wafers, and seasonal organic mangoes. I've hired people for support. Today, people in my Maninagar neighbourhood recognize me as the 'spice and mango lady.'” (High-income woman with orthopedic disability)

She gives credit to her family's support for her success. But not every effort succeeds. Another woman trained in beauty work, then hit a wall:

“I did take a course [in beauty parlour work] but then realised I probably couldn't do that job... You have to stand up. I'm not interested in that. There are limitations in placing things.”

Still, she emphasized the possibility of earning from home for others like her:

"We can work sitting at home. It's not necessary to go out to earn a living."

A deaf and mute woman who comes from a family where all family members are deaf, had to adapt quickly to her new environment in Gujarat:

I can not stand, Yet I stand on my own : Geetaben's tale

— “ —
I may not stand on my feet – but I stand tall, self-reliant and proud.
— ” —



Polio took away my ability to walk at five. But it never took away my determination. Today, I live alone in Ahmedabad – earning, cooking, managing rent and bills – all on my own. From a small village shop to running a hostel kitchen for visually impaired working women, to now doing online work and managing a job – my journey has been full of struggles, but even fuller with self-belief. My Activa scooter is my freedom – it takes me everywhere. Wheelchairs? Often too heavy and impractical. Electric scooters? Great idea, but too expensive and risky without nearby service stations. Government schemes exist, but the red tape makes them out of reach for many like me who can't afford to lose a day's work. I've adapted my home to cook while sitting. I've built a life that works for me.

Her Call to Action

"In today's age of advancing technology, there are many opportunities—what's needed is access and a little adaptation."

Let's make a world where more people with disabilities can say the same.

"I learned Gujarati after marriage, even though our sign languages were different. I used to get irritated, but I learned and life improved."

Her journey into work—from using a typewriter, to packaging, to now teaching—reflects years of adaptability. Technology played a role too:

"We use YouTube, mobile phones... videos with sign language have improved our communication. Earlier it was very difficult, but now we can progress too." (Deaf and Mute woman)

For some caregivers and family-based tailoring units, work was quietly collaborative between mother and daughter:

"[Deaf and mute daughter] oversees attaching buttons and zippers, while I focus on sewing." (Caregiver)



Figure 28: સિલાઈ કામમાં સાડી પર ફોલ ચડાવવી, તકિયાના કવર બનાવવા, અન્ય કપડાની સિલાઈ જેવા નાના મોટા કામ કરું છું. આ બધું મે જાતે જ શીખ્યું છે. દરરોજ આ માટે કામ નથી મળતું. જ્યારે કામ મળે ત્યારે કામ કરું છું. આના જે પૈસા મળે તેને હું મારા જ ખર્ચમાં વાપરું છું. ક્યારેક પાણીપુરી ખાઉં, મોબાઇલ રીચાર્જ કરાવું.”

{Translation: “In sewing work, I do small and big tasks like adding fall to sarees, making pillow covers, and stitching other clothes. I’ve learned all this on my own. I don’t get work every day, but I take it up whenever I do. I use the money I earn for my own expenses—sometimes I eat *pani puri* or recharge my mobile.” (Photo © Sheelaben Bhoi)

A couple with disabilities who work side by side, found dignity in their shared effort:

“If [wife] sews the sleeves, I handle the back of the top. We earn based on how much we produce.”

While navigating challenges like stair access to the workplace, they found their employer accommodating:

“Discipline is expected, but our employer is understanding. We get some flexibility when needed.”

Yet, systemic barriers persist. As a professional from a disability-inclusive school pointed out,

“Despite technological advances, most hearing-impaired workers remain confined to low-skill, low-wage manual occupations.”

Across these diverse stories, the common thread? Economic empowerment isn’t just income—it’s dignity. *It’s the right to fail, adapt, and demand respect in a world that often overlooks their capabilities.”*

The Kitchen as a Battleground: Safety vs. Autonomy

Energy choices aren’t about preference—they’re about compromise. For caregivers, cooking can feel like a high-wire act. One mother admits:

“I can’t leave my daughter alone. If I’m in the kitchen, she must be in sight. Some days, we skip meals.”

Others reinvent their spaces. A parent of a visually impaired child redesigned their kitchen: marking stove edges, taping hot spots, stripping clutter. For those living alone, inaccessible design forces reliance on ready-made food—or hunger when help doesn't come. The irony? While officials tout “energy access,” none mentioned *usable* kitchens for PwDs. The gap isn't just policy—it's imagination.

Aspirations: “Why Can't the Kitchen Count Too?”

Respondents didn't just voice struggles—they named solutions. Subsidized LPG. Safer appliances. Solar tools. Disability-friendly designs. One mother's plea stuck:

“If we get disability certificates and bus passes, why not kitchen aids?”

Renewable energy tantalizes but feels elitist: *“Solar's good, but not for the poor,”* a father shrugs.

These are not niche demands—they're lifelines. When a hearing-aid user misses work due to power cuts, or a seamstress loses income because her fan fails, energy poverty steals more than comfort; it steals *futures*.

Design Justice: Who's Included? Who's Ignored?

A design expert's insight cuts deep: most designs cater to urban, able-bodied youth. Rural elders, slum dwellers, and PwDs are afterthoughts. Fancy assistive tools? For many, they are science fiction. The real innovation lies in grassroots fixes—modified stoves, repurposed fans—crafted by those excluded by mainstream solutions. The challenge? Scaling their ingenuity *without* stripping away context.

The lesson is clear: energy access isn't a sidebar to economic inclusion—it's the bedrock. To unlock livelihoods, we must start where life happens:

- **Homes** with kitchens that don't demand superhuman vigilance.
- **Policies** that treat energy aids as essential as wheelchairs.
- **Markets** that serve low-income disabled users, not just elites.

This isn't about charity. It's about *justice*—co-created, intersectional, and unflinchingly practical. The solutions exist. The question is: *Who's listening?*

Economic Dependence and Control

Financial independence, for women with visual impairments, often remains superficial—present in form but absent in substance. The mere ability to earn an income does not guarantee autonomy over that income. Many blind women find their earnings closely monitored, controlled, or even confiscated by family members, under the guise of protection or support.

One illustrative case is that of a blind physiotherapist whose monthly salary and ATM card were entirely managed by her brother. To the outside world, she appeared economically self-reliant; yet in reality, she had no access to her own finances, no say in how her income was used, and no

autonomy in financial decision-making. Her identity as a professional was overshadowed by her family's control over her resources.

In another deeply troubling instance, a blind woman employed as a teacher was coerced into taking loans to fund her siblings' weddings. Despite her consistent financial contributions to the household, her own needs and rights were deprioritized. Her family delayed and resisted any efforts to arrange her marriage until they could secure a match with a man three decades her senior—an arrangement made not in her interest but to ensure continued control over her income. Her eventual decision to flee her home was not an act of rebellion, but one of survival and self-preservation.

These cases reflect a pervasive pattern of **economic exploitation masked as familial care**, where blind women are treated as perpetual dependents or income sources rather than autonomous individuals. Such experiences underline the intersectional vulnerabilities of being both blind and female in a patriarchal context—where earning power does not shield one from manipulation, and where rights to financial self-determination are routinely denied.

Addressing these calls for **multi-layered interventions**: legal safeguards, financial literacy programs, gender-sensitive community education, and institutional mechanisms that empower blind women to retain control over their earnings and life choices. Without these, economic empowerment remains incomplete compromised by the very structures meant to support them.

Class and Urban-Rural Economic Divides

Economic divides between classes and rural dimensions also shape experiences of cooking and other energy uses for people with disabilities. An academic specializing in design noted that slum dwellers with disabilities face spatial constraints, limiting universal design applicability. Further, this academic observed that urban design trends often cater to youth, marginalizing elderly populations in rural areas who are the primary users of household utilities. She noted that spatial constraints in slums also hinder the applicability of universal designs. Rural and low-income families struggle to access specialized equipment, unlike affluent families who can afford custom solutions (e.g., prosthetics). Urban youth-centric designs exclude elderly populations, as the expert noted, giving an example that villages in Kerala with aging residents lack adaptive tools.

Experiences of Caregivers in Meeting the Energy Needs of People with Disabilities

Caregivers played a central role in meeting the energy needs of people with disabilities in Ahmedabad. The data revealed that caregivers needed to navigate a wide range of challenges which were fundamentally shaped by the cultural context of Gujarat.

Gendered Roles in Caregiving

Caregiving and meeting the needs of people with disabilities was split along gendered lines, with women taking on most of the care and cooking. In one case, a mother had to leave her job at a garment factory to be able to take care of her son. Yet in some households with men and boys with disabilities, husbands and brothers took on certain roles including dressing and clothing them. In

one case, a man realized the extent of care undertaken by his wife during the COVID-19 lockdown, and took on the role of making sure their disabled son ate his meals cooked by her:

“There comes a time when we see what he is to me and what I am to him. When that understanding comes, then there is that appreciation of how hard we work. Now he understands! He’ll now sit down and help with making sure [son] eats. [The son] doesn’t always eat so he has to sit with him to make sure he finishes. My husband will do this in the evening after he comes.” (Caregiver)

Normalizing Care

Women providing care for people with disabilities noted how they *“just have to become normal and get used to all of this”* (Caregiver). Women caregivers needed to come to terms with caring and cooking for people with disabilities alongside their siblings.

Cooking and Household Chores

Women caregivers were predominantly responsible for cooking for people with disabilities and household chores. Waking up before the rest of the household to cook for the person with a disability along with the rest of the family was common, which was compounded by the people with disabilities in their families not being able to do much apart from small tasks such as peeling peas and putting things back from where they came from in different parts of the house. Some women were caring for multiple children with disabilities, and found it challenging to do tasks such as cooking breakfast for them because they needed to stay with them all of the time when they were awake, and would cook before they woke up each day. One caregiver noted that cooking for her son was difficult because he insisted that his parents sit with him to watch TV whenever he was not at school.

Cooking was a time-consuming process for women caregivers:

“I spend about 2 hours in the kitchen in the morning, Then I cook lunch, then I cook the evening meal, so that is three lots of cooking. About 4 hours goes into this.” (Caregiver)

Women caring for multiple children with disabilities found themselves navigating being able to cater for their different food preferences and specific needs. One mother described how her disabled daughter liked some foods which were not spicy, whereas her disabled son had only recently begun to eat food recently in general. This mother said that she needs to cook two separate sets of meals each day, one for her and her husband, and a less spicy version for her children. The mother also noted how because of her children’s specific preferences for food, she would still have to cook for them even when the family goes out to a restaurant for dinner:

“Otherwise, we go out, then we have to come home and cook something like khichdi and that’s where our attention goes. We have to come home, and then cook for the children! Or I have to cook it before we go out! When we are going for dinner, I already know they won’t eat it, so I have to spend half an hour cooking before I go. You can’t leave them hungry. They’ll eat it later.” (Caregiver)

Other caregivers also noted how their children with disabilities would only eat certain types of food. A mother described how her son would always want to eat only *Rotis* and no other dry foods, and that he had to eat his *Rotis* otherwise he would not eat his lunch with other foods with the rest of the family. The mother said how whether she was feeling tired or not, she would always have to make *Rotis* for him. Prior to this, her son would only eat scrambled eggs, and not omelettes.

Cooking for people with disabilities made caregivers wary of safety:

"In the kitchen whenever I am using the gas cooker, I have to be careful with it and keep watch. My children don't understand, they will come and try to touch the oil when I am frying papad and I have to be careful and watch. I have to make sure I move things away immediately and keep it on the side."

(Caregiver)

Caregivers were concerned about people with disabilities being able to use kitchen appliances safely. One mother did not let her daughter use a hand mixer for instance, because she was worried about her ability to grip it properly and use it safely. Appliances which were designed differently or had a switch was preferred by the caregiver because she felt it would be easier for her daughter to use, otherwise she would not be able to use it. Other caregivers invested in appliances such as fridges and ovens recently, giving them scope to cook other foods such as pizza as per people with disabilities' preferences. Appliances such as microwaves were noted as useful for warming food quickly, unlike gas stoves where women caregivers needed to spend time stirring food to warm it up for people with disabilities. Mixers and washing machines contributed to reducing the time caregivers spent doing household chores. In one case, a washing machine was transformative for one caregiver's daily routine:

"I've had and been using the washing machine for 4, 5 years now whereas before I'd just wash the clothes by hand. Before there were 17 of us and 3-4 hours of my day would just go into washing clothes, but now everyone is living separately. I used to do it with my sister-in-law. There will be some difference surely in the quality of the washing from the machine and colours running, from when you wash it by hand and then you dry it out in the sun. there are definitely differences. But it saves time. But there's always decisions to make about what needs to be done and washed now and what can wait until later." (Caregiver)

Mobile Phones as Support

Reliable access to electricity in Ahmedabad at the time of data collection was noted as a factor which made cooking, housework and errands easier, because caregivers were able to distract their children with technologies such as mobile phones:

"There are channels and videos and things on YouTube that I can connect him to through my mobile. Once's he's connected on the mobile he just doesn't care about anything! Somehow you just have to find a route through to him. If we don't we feel bad that what will happen to the child." (Caregiver)

Despite the challenges of people with disabilities using up mobile data quickly and incurring costs, and caregivers sometimes being unable to use mobile phones for their own pleasure such as listening to religious hymns, mobile phones were seen as a route for parents to encourage children

with disabilities to develop their communication skills. Being able to video call relatives such as grandparents helped caregivers to develop their children's ability to have a conversation through the mobile phone. For other caregivers, enabling their children to watch videos was seen as an alternative to watching TV for children who could not see properly, and gave the caregivers some respite. In some cases, a mobile phone to watch videos was vital for caregivers to ensure that their children were not agitated, and keep a calm environment at home. Mobile phones were also a vital line of communication for caregivers to keep in contact with people with disabilities when they were away from home.

Caregivers relied on mobile phones to be able to gather online information about people with disabilities' medications and their side effects. One caregiver said that while she does not find online material to be highly effective—since each child faces unique challenges—she tries to make use of any reliable information she can find. Additionally, she discusses these matters with other mothers at the foundation to better understand what changes she might expect in her son as he grows.

Managing Routines for People with Disabilities

Caregivers were responsible for managing the daily routines for people with disabilities, from getting them ready, taking them to school, having a bedtime routine and managing their continence needs. Routines also revolved around encouraging people with disabilities to eat and what they liked to eat and when:

"If he goes to sleep at lunch and in the afternoon then by early evening around 5pm [son] will want tea and milk, chavanu, puri and snacks like that." (Caregiver)

One couple both had disabilities, worked, and cared for each other, and therefore routine was key for both, because they worked at the same place for long hours. Routine and care were however more important to the wife with a disability. The responsibility of collecting water from a communal water point for the day lay with her each morning, which was difficult due to her mobility challenges. The wife was also responsible for washing clothes with a recently bought washing machine, highlighting the importance of access to electricity for women with disabilities in particular. Overall, caregivers were also responsible for ensuring that people with disabilities accessed support such as physiotherapy as part of their daily routines, yet none of the caregivers interviewed referred to the use of machinery as part of this, because it was not available to them when they needed it as children.

Increased Dependency of People with Disabilities

Caregivers faced challenges of increased dependency of people with disabilities on them, in large part due to the cultural context of Gujarat where independence of people with disabilities is not universally encouraged. Aside from women needing to take their children wherever they went including funerals because the children did not feel comfortable without them, caregivers themselves openly admitted that they played a role in making people with disabilities dependent

upon them. One mother specifically opened up about the ways in which her fears and worries as a caregiver had made her son dependent upon her:

“He can’t do things like washing and cutting vegetables or washing up dishes. I don’t want to get him involved in cutting because I feel scared that he won’t know that he can get cut. The things we involve him in are things like putting things in certain places.”

“If [son] was my daughter I would have taught things like washing up. Because he is the first born he does get extra attention and love from us. I sat and taught him and educated him myself, he listens to me if I give him a stern warning and tell him not to do something and he’ll do it.”

“It is the case that we have made him dependent instead of independent. My parents-in-law did have a role to play in that because they didn’t like us telling him off and then he became stubborn. I felt that we had to be a bit strict with him from the beginning but trying to be strict with him later and telling him he can’t do this or that doesn’t work. We have to show them that look that child is well behaved but we haven’t told [son] off or been strict with him from the start, ever. I tried to but my in laws didn’t accept it.” (Caregiver)

Support of Family for Caregivers

Caregivers highlighted how the support of their families was important in ensuring that they could meet the energy needs of people with disabilities. At times, aside from support for caregiving itself including at times when people with disabilities became sick, caregivers needed financial support to pay for rising electricity bills, and also to take care of their own health:

“I have a good support system through my brothers and sisters. Because the costs of using electricity have gone up between 50-100%, we get that 50% support and then I pay the rest. I used to have a job and go to work but I can’t now, it’s just not possible. But how much will one person do? Now it feels like what I am doing is to pass the time away. It has a negative impact on your body.” (Caregiver)

Enabled but Unequal: What Abid's Story Reveals About Disability, Work, and Energy

— “ —

A community can enable, but it cannot replace a system.

” —



Community First, System Later

Abid learned to walk at age 7–8 using wooden aids built by his grandparents. He entered school only after a neighbor intervened. Teachers, classmates, and community members stepped in to bridge the gaps left by the formal system. His story shows how care networks operate in the absence of state infrastructure.

Work without Protection

Though skilled in tailoring, Abid was underpaid, undervalued, and often dismissed. He earned less than others doing the same work. No policies guaranteed fair wages or support for disabled workers. Being able was not enough — being recognized as able was a systemic barrier.

Energy Isn't Enough Without Usability

Abid injured himself learning to use electric sewing machines — with no training or safeguards. He now prefers modern, speed-controlled machines. But his story reminds us: Access doesn't equal inclusion if the technology isn't adaptable.

Cooking, Risk and Gendered Roles

As a child, he cooked over a coal stove, using firewood and reused ashes to feed his family. Now, he doesn't cook — not due to ability, but because gender and risk shape who manages energy at home.

Technology without Autonomy

Abid owns an electric vehicle — but can't brake alone. His wife drives. Design flaws prevent full independence, even when the tools exist.

What Abid's story asks of Us

Despite no energy subsidies, no state support, and irregular work, Abid continues. But his story is not about coping — it's about the gaps that make coping necessary. Let's reimagine energy inclusion: with accessible design, fair wages, and real support systems.

Resilience shouldn't be a requirement for basic dignity.

Whilst many women caregivers held the responsibility for cooking, at times, mothers caring for disabled children shared cooking duties with their mother-in-law. Husbands also made sure that children with disabilities would eat meals properly.

Encouraging People with Disabilities to Learn Life Skills

Caregivers had varied experiences of trying to encourage people with disabilities to learn cooking and other life skills. One caregiver described how her son was not willing to learn skills and became very angry if attempts were made to teach him. When attempts were made to teach him to pick up groceries, he would tear up or throw away the list he was given and would end up bringing back different things than what he had been asked to get. Another caregiver actively gave her daughter chores such as dusting, mopping and peeling vegetables – but stopped short of teaching her to cut vegetables up due to fears over her hurting herself with a knife, and therefore would not give her a knife at all.

Caregivers' Health and Self-care

Caregivers highlighted the challenges of being able to look after themselves whilst cooking and providing other care for people with disabilities. One caregiver stressed the importance of caregivers needing to take time out from the day and activities including cooking, *“because as well as looking after them, we have to look after ourselves too. If we don't it's bad for us.”* (Caregiver)

A mother of a deaf and mute woman faced mobility challenges due to a condition affecting her legs, which makes walking difficult, and has a heart condition too. In this situation, the caregiver was in fact able to delegate most of the household responsibilities, including cooking, dishwashing, laundry, and other daily chores. This reflects the nature in which caregiving can work both ways, where the person with a disability can too be a “caregiver” themselves if they can cook and do other tasks where their caregiver may be unable to do so.

Urban Planning, Housing and Energy Infrastructure

Urban planning at a wider scale in Ahmedabad shaped experiences of access to and use of energy for people with disabilities. Most of the families in the research lived in informal or semi-legal settlements in urban Ahmedabad, where access to basic infrastructure was already compromised. Electricity connections were often shared, borrowed, or illegally tapped—leaving families with unreliable supply, frequent fluctuations, and **no formal complaint mechanisms**. As one father shared:

“We use a common wire to draw electricity from the neighbours. If there's an issue, we have no meter, no number to call. My daughter has epilepsy—if the fan stops, she gets triggered.” (Caregiver)

Such conditions reflect **structural exclusion**, where energy services, home design, and urban planning remain oblivious to the realities of disability. An urban planner reflected on efforts to provide metered connections to electricity for households in slums when residents have challenges in being able to prove tenure, which have an impact on the degree to which people with disabilities can meet their electricity needs:

“How do you prove that, you know, this is kind of what are the alternate ways in which you can say that [...] lives in this particular house in a slum and, you know, then you provide me a connection. So, a lot of work around that has happened and that helped slums at least get metered connections. So, here where each household pays for its electricity, in MP, in Madhya Pradesh, I know for a fact that there were, a few years back, there were schemes for that.”

“They used to call it the single bulb kind of a thing. So, at least you have that one bulb, one kind of a connection to each slum household. That was at least given.” (Urban planner)

Whilst this was a free provision, the urban planner highlighted that these schemes vary from state to state in India. There is a clear need for better integration of different sectors such as housing, energy, and disability across the country rather than on a state-by-state basis to ensure that the energy needs of people with disabilities can be met at a household level.

Housing design itself posed significant challenges. In one settlement, narrow staircases and high thresholds made it impossible for wheelchair users to access kitchens. Electrical switches were often **too high** for use by PwDs, and poorly ventilated cooking spaces heightened the risks of LPG use. High-income participants also faced other electricity-related challenges living in apartments in more affluent areas of Ahmedabad. PhotoVoice revealed that communal lifts in apartment blocks that were powered by electricity were not designed to be big enough for electric wheelchairs to fit into (Figure 29), and that lifts such as chairlifts had not been installed internally in flats with more than one floor, leaving people in wheelchairs unable to access all parts of their own home (Figure 30).



Figure 29: “લિફ્ટમાં જગ્યા ઓછી હોવાથી મારી ઇલેક્ટ્રિક વ્હીલચેર તેમાં ફિટ થતી નથી. મારે નીચે જવું હોય તો કોઈએ મને મેન્યુઅલ વ્હીલચેરમાં લઈ જઈને મદદ કરવી પડે છે.”

{Translation: “The elevator has tiny space so my electric wheelchair doesn’t fit in there. Someone has to help me with my manual wheelchair in order for me to go downstairs.” (Photo © Rajviben Gosalia)}



Figure 30: "આ સીડીઓ ખૂબ જ અસુવિધાજનક છે કારણકે હું સ્વતંત્ર રીતે તે ચડી શકતી નથી. હું ઉપરના માળે મારી જાતે જઈ શકતી નથી. બે લોકોએ મને ઉપાડીને ત્યાં લઈ જવી પડે છે."

{Translation: "These stairs are a huge inconvenience because I cannot access them independently. I cannot access the space upstairs on my own. Two people need to pick me up and carry me there." (Photo © Rajviben Gosalia)}

People who were hearing-impaired found innovative ways to adapt their homes using electricity. One woman described how as her entire family were deaf, no members of the household could hear the doorbell, requiring a different approach to knowing whether somebody was at the door:

"We are all deaf in my house, so instead of a doorbell, we have placed a light, and the light goes on and off. If someone is outside and the light goes on and off, then we can tell. We've just put a normal bulb on, not a white one but the yellow ones you used to get before. So, when that goes on and off, we know that there is somebody there." (Woman with hearing impairment)

Drawings also highlighted how existing housing designs, particularly in low-income areas of Ahmedabad, seldom adhere to housing standards and regulations for accessibility for people with disabilities:



Figure 31: Drawing highlighting the need for kitchen re-design in homes in Ahmedabad (Drawing © Chandrika Soni Vasantbhai)

Chandrika Soni Vasantbhai, a woman with a Cerebral Palsy affecting her legs, requires floor-level adaptations for cooking as she cannot stand. With her mother severely ill, Soni bears full responsibility for domestic chores, including meal preparation. Her drawing powerfully advocates for kitchen redesign—emphasizing that workspaces must be organized at accessible heights to accommodate her mobility needs. This visual narrative underscores how conventional kitchen designs exclude wheelchair users and those who cook while seated, transforming daily necessities into physical challenges. Soni’s experience reflects violations of Article 9 of the UNCRPD (accessibility), calling for enforceable housing standards to mandate adaptable kitchen designs in low-income homes. The persistent gap between policy and practice disproportionately affects women with disabilities like Soni, who face compounded barriers due to both gender and disability discrimination in access to adequate housing.

These findings reveal that conventional kitchen designs in low-income housing projects consistently ignore the needs of wheelchair users and individuals with mobility impairments. This oversight persists despite clear provisions in - The Rights of Persons with Disabilities Act (2016), which incorporates UNCRPD principles; The Harmonized Guidelines for Universal Accessibility (2021) and The Pradhan Mantri Awas Yojana's accessibility commitments. The consequences of this exclusion are severe:

- Compromised safety (increased risk of burns, falls)
- Loss of independence in daily activities
- Additional physical strain exacerbating existing disabilities
- Psychological impacts from constant struggle with basic tasks

Soni's case underscores the urgent need to translate UNCRPD principles into enforceable local building codes and housing policies. Without such measures, millions of Indians with disabilities will continue to face preventable barriers to independent living, with women like Soni bearing the heaviest burden of these systemic failures. The right to accessible housing must move from paper to practice through coordinated action between disability organizations, urban planners, and policymakers.

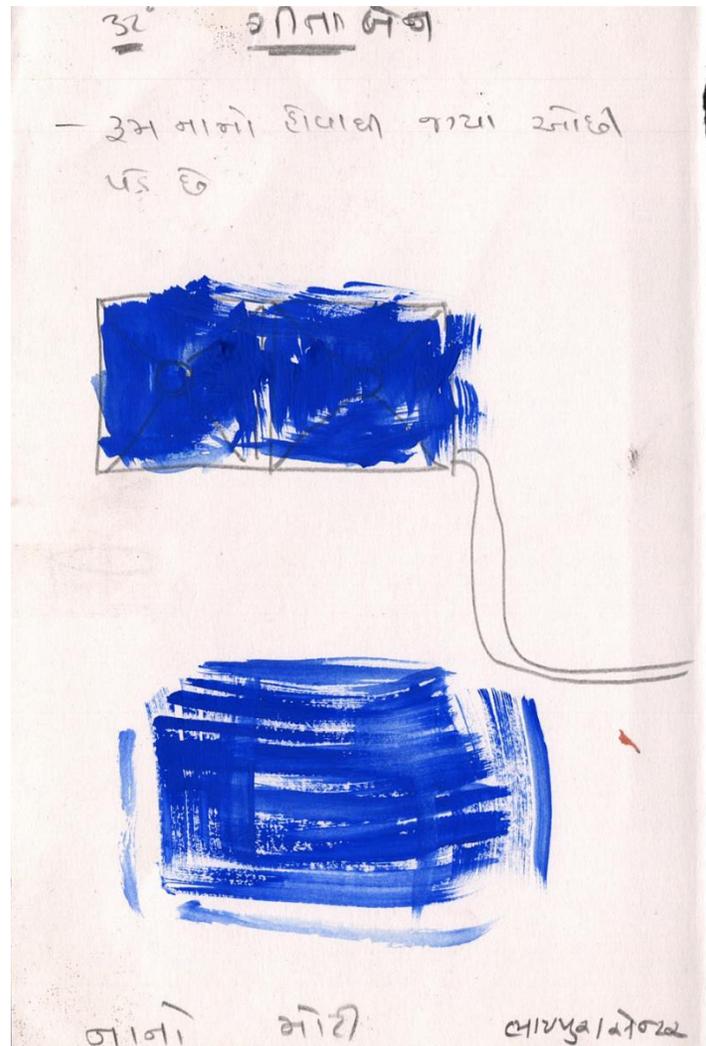


Figure 32: Drawing of challenges of gas cylinder management (Drawing © Geetaben Umeshbhai)

Geetaben Umeshbhai highlighted through her drawing how spatial constraints in her home create significant accessibility challenges, particularly regarding gas cylinder management. The limited maneuvering area not only restricts movement but also complicates essential safety tasks like cylinder replacement. Compounding this issue, the cramped conditions make it difficult to properly inspect and maintain gas equipment - potential problems with regulators or connecting pipes often

go unnoticed until they become serious hazards. This situation reveals how inadequate housing design disproportionately impacts safety for residents with mobility needs.

This case underscores the need for universal design principles in affordable housing, where even modest increases in clearance space and better equipment placement could significantly improve both accessibility and safety for all residents.

Energy concerns for people with disabilities beyond the home and in the wider urban environment, particularly through urban transport, were also illustrated through drawings.

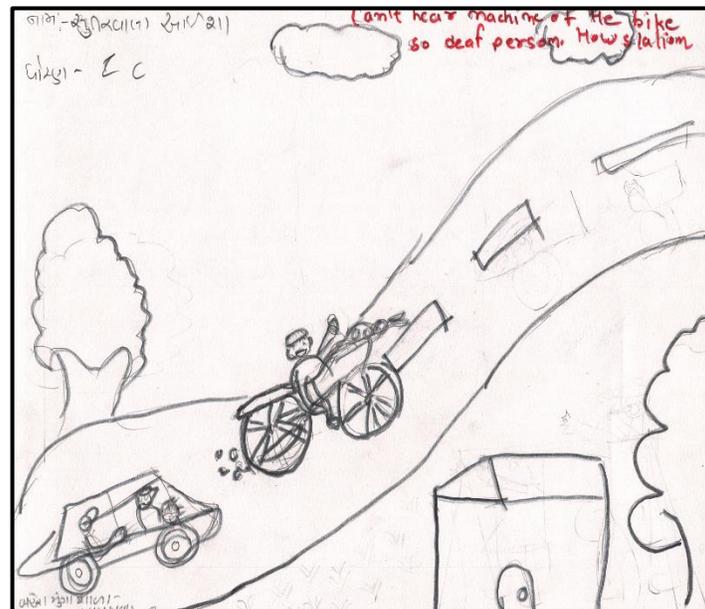


Figure 33: Challenges in urban environments for deaf individuals (Drawing © Aaisha Sutarwala)

Ms. Aaisha Sutarwala passionately advocates for independent mobility yet faces systemic barriers due to societal perceptions of deaf drivers. Current regulations prohibit deaf individuals from driving, citing safety concerns about their inability to hear vehicle horns or approaching sounds. However, Aaisha challenges this limitation, questioning why alternative solutions haven't been implemented and when the system will adapt to enable deaf individuals to drive safely. Her perspective highlights the tension between current infrastructure limitations and the disability community's right to equitable transportation options.

This dilemma reflects broader accessibility debates, where technological solutions (like visual alert systems) could potentially mitigate safety concerns while advancing transportation equity. Several countries have begun piloting adaptive systems for deaf drivers, suggesting Aaisha's aspirations may soon become achievable.

An expert supporting people with visual impairments highlighted how when it comes to transport costs, accessibility remains a structural barrier. Public transport is rarely designed with the visually impaired in mind. The journey from one's home to the bus stop is fraught with navigational

obstacles. As a result, many blind individuals rely heavily on auto-rickshaws, incurring costs as high as ₹15,000 (\$175 USD) per month — a significant amount, particularly for those in lower income brackets. One caregiver had a dedicated auto-rickshaw service set up to take her disabled son to and from school, because transport in Ahmedabad was inaccessible for him. One woman with an orthopedic disability also highlighted the challenges she faced with transport in the village she is from, compared to Ahmedabad:

“I haven’t got the vehicle because I haven’t needed to, I’ll manage my own way if I need to. I don’t need the vehicle right now because I don’t have a problem with money, I don’t feel comfortable using one, and as I am still young in age, my mum is saying not to get one. But we should have one really.

When I’m in the village I don’t really go anywhere, but right now I’m in Ahmedabad so I book an auto or something. Without apps and things it is difficult to get around if you haven’t seen the routes or the roads before. If you’re in a taxi it’s no problem. I don’t go out on my own to go exploring, I only go somewhere if someone comes to collect me. I’m not afraid of travelling on my own around Ahmedabad, I’ve got a good idea now of how to get around. But home are more afraid than me and would rather come to me, even if it takes them the whole day and they tell me that I shouldn’t come to them in the village. So my brother comes to collect me and drops me off again.” (Woman with orthopedic disability)

Experts highlighted that urban beautification projects often worsen the situation. Footpaths are increasingly encroached by plants, fencing, or decorative elements that serve as hazards for blind pedestrians. These add to the risk of accidents and restrict their independent mobility. A more inclusive approach to urban design — ensuring safe streets and safe footpaths — is essential.

Access to electricity is key to including people with disabilities in settlements overall. A physiotherapist gave her observations on aspects of India’s existing infrastructure that she felt needed to be improved for people with disabilities, all of which depend on electricity:

“I strongly believe that India needs to enhance its infrastructure, particularly in public spaces such as railway stations, washrooms, and banks, to ensure accessibility for all. Individuals with orthopedic disabilities often face severe challenges—some are forced to support themselves by placing their hands on unhygienic restroom floors just to use the toilet. Where most people hesitate to even step in with their feet, these individuals must compromise their hygiene in ways that are both unsafe and unacceptable.” (Physiotherapist)

Access to services which could enable people with disabilities to study and subsequently to find employment to be able to pay for their energy needs was variable in the city. As a deaf and mute woman summarized, *“Light is very important for education. How can you study at night without light?”*. One expert at a Deaf and Mute School highlighted key design omissions in urban infrastructure. Schools lack basic accommodation like visual alert systems to compensate for auditory limitations. Comprehensive support systems for device maintenance and user education remain conspicuously absent.

One woman described how she was able to find student accommodation and meals in Ahmedabad, but finding a job was more challenging. In the face of this challenge, she and her friends formed a

trust and started a hostel for visually impaired working women to support each other. The ability of people with disabilities to meet their own energy requirements is shaped by the services and opportunities available in human settlements, and their ability to use them to their advantage to earn a living and have a good quality of life.

Government, Community and Institutional Support Mechanisms

Absence of a Disability Lens in Energy Policy

There is a recurring theme throughout the narratives and expert interviews: energy policy in India remains overwhelmingly technical and economic, with little to no recognition of the unique needs of people with disabilities. Whether it's about inaccessible meters, the inability to lift gas cylinders, or the lack of visual or tactile indicators on appliances, the absence of user-centered design and inclusive planning is glaring. Energy access is still treated as a technical or economic issue, not as a right linked to health, dignity, and inclusion. This insight underscores a foundational policy gap: energy is not being framed as a human rights issue, especially not for marginalized communities like people with disabilities.

Government Schemes: Patchy Reach and Low Awareness

While schemes like PMUY (Ujjwala Yojana) and ADIP are mentioned, their awareness and usability among people with disabilities is deeply limited. Often, users either do not know about the schemes or face bureaucratic hurdles too costly to afford—especially for daily wage earners. Some respondents knew of schemes but chose not to engage due to complexity or poor perceived benefits. Others accessed schemes only through informal networks or self-help groups, not direct outreach. As one woman summarized,

"You might think there are many government schemes for us... but practically, the administrative processes take so much time that someone like me—who earns daily—can't afford to lose even a day's wage."

This reveals a double exclusion: the schemes exist, but they are neither accessible nor adaptive, especially for the disabled poor.

Informal Community Coping vs. Institutional Apathy

Many people with disabilities and their caregivers have built improvised, informal coping mechanisms—borrowing electricity via extension boards, elevating stoves with bricks, or relying on neighbors for refills. These are born out of necessity, not systemic support.

"My neighbor lights the stove if I'm not home... she knows how difficult it is for me to lift the cylinder."
(Person with disability)

This illustrates both resilience and systemic failure: community-driven solutions fill the vacuum left by non-responsive institutions.

Institutional Engagement: Sporadic, Risk-Averse, and Often Non-Inclusive

Even institutions that do work with people with disabilities tend to focus on risk avoidance, especially when it comes to energy. Vocational centers avoid gas stoves, preferring “no-flame”

cooking to ensure safety. Energy is used indirectly in educational programs, e.g., audiovisual learning, but not integrated as a core skill or need. There is no systematic curriculum around energy usage or device literacy for PwDs. The risk-averse culture often overrides the right to independent living or skill development. Institutions seem to opt out of teaching energy-based skills rather than adapting them.

Lack of Cross-Sectoral Coordination

Even when good policies exist—like the Disability Act (2016)—they remain siloed. Ministries don't talk to each other; disability data isn't aligned with energy access databases.

"Even if you have a scheme for providing electricity... where are you going to get the data for who's disabled? That data sits with someone else." (Urban planner)

This lack of data interoperability and inter-ministerial collaboration means that no single agency takes ownership of ensuring energy equity for people with disabilities.

Unseen Needs: Bridging the Gender Gap in Energy Access

The data reveals an uncomfortable truth – energy programs often miss critical nuances in how women and girls with disabilities interact with technology. Three glaring gaps stand out:

- Kitchen technologies rarely account for mobility or sensory impairments
- Caregiving energy needs (mostly shouldered by women) remain an afterthought

Cultural cooking preferences get labeled as "resistance to change" rather than design input. The consequence? Assistive devices that look progressive on spreadsheets but sit unused in homes.

Emerging evidence reveals that energy programs achieve 3-4× higher adoption rates when women with disabilities lead the design process (Comparative Study: Disability Rights Fund (DRF) Participatory Design Impact Assessment, Covering 11 states - 2023. Resources - Disability Rights Fund). Three proven models demonstrate this transformative approach:

1. Assam's Inclusive Cookstove Initiative⁴

Challenge: 87% of women with mobility impairments reported burn injuries from standard LPG stoves (PHED Assam, 2022).

Solution: Co-designed side-access stoves with:

- Knee-space clearance for wheelchair users.
- Anti-tip frames tested by women with cerebral palsy

Result: 78% sustained adoption vs. 19% for conventional models

⁴ Primary Source: PHED Assam Annual Report 2021-22 (pp. 34-37), Available at: <https://phe.assam.gov.in/>; Secondary Validation: Dasgupta, R. & Choudhury, M. (2022). *Disability-Inclusive Energy Solutions in Northeast India*. TERI Discussion Paper (pp. 12-15)

2. Tamil Nadu's Accessible Solar Charging⁵

Breakthrough: Tactile charging docks with audio cues developed by blind women's collectives reduced charging accidents by 63% (SELCO Foundation, 2023).

Scale: Now replicated across 400+ households in 3 states

3. Rajasthan's Anganwadi Accessibility⁶

Innovation: Height-adjustable blenders with color-coded controls boosted nutrition center participation by 92% among mothers with disabilities (ICDS Rajasthan, 2021).

These cases prove that when programs:

- Recruit women with disabilities as paid design consultants
- Allocate 15-20% of budgets for prototype testing
- Use community feedback loops (not just one-time surveys)

...energy access becomes truly inclusive rather than theoretically "available."

Small Wins, Big Gaps: The Quiet Fight for Inclusive Energy Access

The Bright Spots:

Amid the dysfunction, some grassroots NGOs are making real headway—working closely with communities, using simple tools like videos to demonstrate how energy access transforms lives. They're not just demanding change; they're *making it happen* on the ground.

The Broken System:

On paper, solutions exist. In reality? Government programs are crippled by poor coordination, low awareness, and limitations to truly include people with disabilities. Energy access remains a matter of chance, not equity.

The Real Picture:

The real innovation isn't coming from the top—it's emerging from families and local groups who refuse to wait. Their resourcefulness proves what's possible. Now, institutions need to step up: policies must be co-designed with people who know the struggle firsthand. Inclusion isn't optional—it's urgent.

⁵ Implementation Partner report: "Energizing Equality" (2023). Disability Rights Alliance Tamil Nadu & SELCO Foundation

Impact Matrix: Ministry of New and Renewable Energy (2022). *Off-Grid Solutions Monitoring Report (Appendix D)*

⁶ Official Documentation: ICDS Rajasthan & CEPT University (2021). *Accessible Nutrition Centers: Field Testing Results*
Peer-Reviewed Analysis: Reddy, A. et al. (2023). "Co-Designing with Rural Women with Disabilities", *Indian Journal of Gender Studies*, 30(2), 145-168

Key Findings

The findings reflect layered and intersectional challenges around disability, energy access, and urban inequities. They are organized thematically to reflect recurring patterns across interviews, participatory tools, and expert inputs.

Accessibility and Physical Barriers

- PwDs encounter **compounded inaccessibility** in housing and public infrastructure: narrow staircases, elevated switchboards, poorly lit shared toilets, and kitchens without adaptive designs, forcing unsafe practices like floor-level cooking.
- **Visually impaired individuals** lack tactile or audio cues on appliances, increasing reliance on hazardous alternatives (e.g., open flames).
- **Public facilities** (clinics, therapy centers, electricity offices) frequently lack ramps, elevators, or adequate lighting, excluding PwDs from essential services.

Energy Dependency and Vulnerability

- Households with PwDs have **higher energy needs** for cooling (fans), heating (heaters), assistive devices (wheelchair chargers), and health equipment (refrigerated medications).
- **Power instability** disrupts critical routines—children with battery-dependent aids face interruptions, while caregivers adjust meal prep, bathing, and therapy schedules around electricity availability.

Economic Constraints and Coping Mechanisms

- **Affordability** is a major barrier: families avoid simultaneous device usage to limit bills, resort to unsafe informal connections, or prioritize energy for health needs over other household uses.
- **Energy rationing** is common, with medical devices often deprioritized due to cost concerns.

Gender, Caregiving, and Invisible Labor

- **Female caregivers** (often mothers) shoulder disproportionate energy-related burdens—managing devices, adjusting routines, and sacrificing their own needs.
- **Women with disabilities** face **double exclusion**: restricted control over energy use and exclusion from household decisions. Elderly PwDs, particularly women, are further marginalized in energy usage.
- Cultural norms **force disabled women into unsafe cooking roles**, with visually impaired women enduring burn injuries and deaf individuals missing auditory safety alerts.

Institutional Gaps and Policy Disconnects

- **Awareness of energy schemes** (e.g., Saubhagya, PMUY) is low among PwDs, and application processes are complex therefore are not accessed.
- **Policies lack disability-inclusive standards**: no mandates for accessible utility designs (e.g., meter height, tactile interfaces) or prioritized service for life-sustaining equipment.

- **Urban data systems** (Census, NSS, SECC) appears to lack capturing disability-specific energy needs, perpetuating planning blind spots.

The Myth of Universal Electrification

While India claims **91% household electrification** (Saubhagya/PMUY), **physical connectivity does not guarantee functional access for PwDs**. They face **de facto exclusion despite de jure connectivity**:

- **62%** of surveyed PwD households in Ahmedabad required caregiver assistance to operate switches/meters.
- **45%** couldn't independently read bills or meter displays.

Electrification metrics ignore:

- Physical accessibility (e.g., unreachable meters, lack of tactile interfaces).
- Safety for sensory/mobility impairments.
- Affordability of sustaining medical devices.

Grassroots Innovations

- **Deaf communities** develop visual alert systems for appliances.
- **Wheelchair users** improvise floor-level cooking spaces.
- **Community networks** establish emergency energy-sharing systems.

Recommendations

True energy inclusion requires a paradigm shift—from viewing disability as a marginal concern to embedding it as a central planning lens. To address the systemic exclusion of persons with disabilities (PwDs) from functional energy access and inclusive urban infrastructure, the following multi-stakeholder recommendations are proposed:

Policy & Institutional Reforms

Disability-Inclusive Energy & Urban Planning

- **Revise electrification policies (Saubhagya, PMUY)** to include **accessibility audits**—mandating tactile switches, audible meters, and reachable infrastructure.
- **Link energy subsidies** (e.g., free/subsidized units) to households with PwDs, prioritizing those with life-sustaining medical devices.
- **Amend building codes** to enforce universal design standards (ramps, lighting, kitchen adaptations) in both public utilities and low-income housing.

Data & Accountability

- **Integrate disability-disaggregated energy needs** into national surveys (NSS, Census, SECC) to inform planning.
- **Establish monitoring frameworks** to track functional (not just technical) energy access for PwDs.

Grassroots & Community Interventions

Affordable Assistive Technologies

- **Subsidize adaptive devices** (e.g., voice-controlled switches, non-slip cooking tools) through partnerships with disability NGOs.
- **Promote decentralized solar solutions** (e.g., battery backups for medical equipment) tailored to PwDs' needs.

Capacity Building

- **Train caregivers** on safe energy practices (e.g., fire hazards, backup management).
- **Peer-to-peer networks:** Scale grassroots innovations (e.g., visual alert systems) through community workshops.
- Train **energy utility staff, urban planners, and Anganwadi or ASHA workers** on disability-inclusive energy service delivery.
- Develop practical **toolkits for caregivers** on safe and energy-efficient routines for households with PwDs.
- Conduct **disability audits** in public electrification and infrastructure projects, using participatory metrics.

Gender-Responsive Measures

- **Targeted energy subsidies** for women caregivers to reduce financial strain.
- **Safe cooking initiatives:** Provide accessible cookstoves and burn-prevention training for visually impaired women.
- **Include PwDs (especially women) in energy decision-making** at household and local governance levels.

Corporate (Disability-inclusive CSR programs) & Utility Engagement

- Energy companies to fund accessible infrastructure (e.g., ramps in electricity offices, braille bills).
- Promote **low-cost, accessible cooking and lighting solutions:** tactile stoves, audio-activated switches, or solar standing fans.
- Encourage **product innovation** in assistive technologies—focusing on energy efficiency and context-specific design.
- Set up **charging stations** for assistive tech (e.g., wheelchairs, hearing aids) in community centers or health facilities.
- **Priority service guarantees:** Utilities to expedite repairs for households with PwDs dependent on medical devices.
- Retrofit public utilities and energy offices with **universal access features:** ramps, visual/audio counters, wider service areas, and accessible signage.
- Embed **gender-sensitive and age-inclusive design** in affordable housing and slum redevelopment, accounting for caregiving realities.

A Final Call: Energy Inclusion through Intersectional, Collaborative Design

Disability must no longer be treated as an “add-on” in urban development. Energy equity for PwDs requires planning that **embraces intersectionality**—recognizing the combined impact of disability, gender, age, and poverty. Achieving these demands **multi-sectoral collaboration**, accessible infrastructure, and active participation by those most affected.

Inclusive energy access is not just a technical fix—it is a social contract rooted in **dignity, design, and rights**.

Conclusion

This study exposes the stark reality of energy exclusion for persons with disabilities in Ahmedabad - a microcosm of India's unfinished inclusion agenda. While national schemes like Saubhagya boast 91% electrification and the Smart Cities Mission promotes urban transformation, our findings reveal how these policies systematically overlook disability access. The Rights of Persons with Disabilities Act (RPwD) 2016 mandates accessibility, yet energy infrastructure remains exclusionary by design.

Ahmedabad's case presents an urgent opportunity to operationalize these national commitments. By implementing accessible energy solutions here - from tactile meters to prioritized power supply for medical equipment - we can create a model for the Smart Cities Mission and inform revisions to the RPwD's implementation guidelines. The upcoming review of India's National Policy on Universal Electronic Accessibility provides another critical window for change.

Gujarat's leadership in renewable energy and urban development positions Ahmedabad to pilot solutions that could transform national policy. As India implements its updated Nationally Determined Contributions (NDCs) with a focus on just energy transitions, disability inclusion must move from afterthought to priority. The time has come to bridge the gap between the RPwD's promise and PwDs' lived reality - and Ahmedabad could light the way.

Appendix

Appendix A: Semi-structured interview questions for parents and caregivers

Semi-structured interview questions for parents and caregivers

- Tell us about yourself.

1. Electricity and Assistive Technology

- To what extent can you ensure that the person you care for has uninterrupted access to electricity for their needs?
- Are you being supported to meet the energy needs of the person you care for?
- Are there challenges you face in maintaining or operating assistive devices due to energy issues?

2. Cooking Fuels

- What type of cooking fuel do you use in your household? How does it meet the needs of the person with a disability?
- Can you describe any opportunities you may have received to support you to access cleaner cooking options, such as electric stoves?
- Have you faced difficulties in affording or accessing cleaner cooking options, such as electric stoves?
- (If using biomass) Do you feel that when the cooking fuel is being used in the home, it is having an impact on the health of the person with a disability, and if so, how?

2a. Cooking Fuels and Gender

- Can you describe any situations where you feel that your gender has enabled you to access or use cleaner cooking options?
- Are there gender-specific challenges in accessing or using cleaner cooking fuels, such as electric stoves?
- To what extent does the availability of cooking fuels impact the time and effort you spend on meal preparation?

3. Adaptations

- Have you made any adaptations in your home to improve energy access for the person with a disability? If so, what?
- What additional support or resources would help you ensure better energy access?

Appendix B: Semi-structured interview questions for People with Disabilities (PWDs)

Semi-structured interview questions for People with Disabilities (PWDs)

- Tell us about yourself, what do you enjoy doing?

1. Electricity Access and Usage

- Can you describe your current access to electricity at home? Is it reliable and affordable?
- How often do you face power outages, and how do they impact your daily activities?
- Can you describe any kind of support you are receiving which you feel is currently supporting your access to energy?

1a. Gender and Energy Access

- How does your gender affect your access to electricity or cooking fuels in your household?
- Have you faced any situations where you feel that your gender has enabled you to access electricity services?
- Have you faced any specific challenges related to energy access that you believe are influenced by your gender?

2. Assistive Technology

- Do you use any assistive devices that require electricity? If so, how do you manage their usage during power outages?
- Is there anything related to the way that you access energy that you feel enables you to use assistive technology?
- Are there any challenges you face in operating or maintaining these devices?

2a. Assistive Technology and Gender

- Are there any gender-specific considerations in using assistive devices, such as privacy, safety, or convenience?
- Do societal perceptions of your gender affect your ability to request or receive support for energy-dependent devices?

3. Cooking Fuels

- What type of cooking fuel do you use?
- What do you like about using this fuel?
- Can you explain how you access this fuel?
- Is it easy to access physically and financially?
- Do you face any physical challenges when using this cooking fuel?
- How safe do you feel when using this fuel?

- Have you considered using electric cooking appliances? Why or why not?
- Do you think the cooking fuel that you use has any impact on your ability to meet your dietary needs, or cooking food that you enjoy, and can you describe how?
- (Particularly for biomass users) Do you think the cooking fuel used at home has an impact on your health, and if so how?

3a. Energy Usage in Household Roles and Gender

- How do your household responsibilities, influenced by your gender, affect your energy needs (e.g., cooking, caregiving)?
- Do you have decision-making power in choosing household energy sources or appliances?

4. Adaptations

- Can you tell us whether you or other people have made adaptations to support you to access energy at home or in the community, and if so, can you describe them?
- What changes or adaptations (in your home or community) would make energy access easier for you?
- Are there any specific support systems or modifications you need to improve energy access?

5. Socio-cultural

- To what extent do you feel you have a choice over how and when you use energy?
- Can you describe the extent to which you feel able to leave the house to do things that you enjoy?
- (Follow up) Do you think this has an impact on your use of energy at home, and if so how?
- How do people in your community perceive your energy needs as a person with a disability? (intent behind community's help that you need)

Appendix C: Semi-structured interview questions for professionals (1): Disabled people's organization staff

Semi-structured interview questions for professionals (1): Disabled people's organization staff

1. Electricity and Assistive Technology

- What is your organization's experience with providing access to electricity for people with disabilities?
- Do you encounter issues with assistive technology that depend on reliable electricity?

1a. Program Design with a Gender Lens

- How does your organization address gender-specific needs in energy access programs for people with disabilities?
- Do your programs consider the differing energy needs of men, women, and non-binary individuals with disabilities?

1b. Gender and Assistive Technology

- Have you observed any gender-based disparities in access to or use of assistive technology that relies on electricity?
- Are there specific challenges women or non-binary individuals with disabilities face in maintaining or charging assistive devices?

1c. Energy Access in Households

- How does your organization engage with women, who often manage household energy use, in promoting cleaner cooking fuels or energy solutions?
- Do you incorporate strategies to empower women in decision-making about household energy?

2. Cooking Fuels

- How does your organization support access to affordable and sustainable cooking fuels for people with disabilities?
- What challenges have you observed in promoting the use of electric cooking appliances?

3. Adaptations

- Have you implemented any initiatives to improve energy access (electricity or cooking) for people with disabilities?
- What types of home or community adaptations do you recommend to address energy access gaps?

4. Socio-cultural

- How do socio-cultural factors impact your work in energy access for people with disabilities?

- Are there any misconceptions or stigmas that you work to address in the community?

1. Policy and Implementation

- What policies or programs does your department have in place to ensure affordable, reliable electricity for people with disabilities?
- How do you monitor the effectiveness of these programs?

2. Cooking Fuels and Clean Energy

- Are there any government subsidies or initiatives to promote cleaner cooking fuels for vulnerable populations, including people with disabilities?
- How accessible are these programs to urban and rural households?

3. Adaptations and Infrastructure

- What steps has your department taken to make energy infrastructure more accessible for people with disabilities?
- Are there any guidelines for public and private spaces to ensure inclusivity in energy access?

4. Socio-cultural

- How do you address socio-cultural barriers that might affect the uptake of energy solutions by people with disabilities?
- Are there any community engagement or awareness programs to promote inclusive energy access?

5. Gender-Inclusive Policies

- How do government policies ensure equitable energy access for people with disabilities across different genders?
- Are there specific programs aimed at supporting women with disabilities in accessing affordable, reliable electricity and cleaner cooking fuels?

6. Gender and Energy Infrastructure

- Do you consider the unique needs of women with disabilities and non-binary individuals with disabilities when designing energy infrastructure (e.g., public lighting, household connections)?
- How do you address gender-based safety concerns related to energy access (e.g., safety in using public charging stations or fetching fuel)?

7. Gender Roles in Energy Decision-Making

- What efforts are made to include women in household and community decision-making regarding energy solutions?
- Are there initiatives to train women in the maintenance or use of energy technologies, such as solar panels or electric cooking devices?

Section 2: Common Questions across all SH

Health Facilities and Energy Access: Investigate energy reliability in health centers and its impact on providing care for people with disabilities.

- Are health facilities in your area equipped to support people with disabilities who require energy-dependent care (e.g., oxygen concentrators)?
- Have you faced any challenges accessing energy-supported medical services?

Climate Change and Energy: Gauge knowledge and attitudes toward renewable energy sources (solar, wind) and their adoption for assistive and household use.

- Are you aware of or currently using any renewable energy solutions? If not, would you consider them?
- What are the challenges in adopting sustainable energy solutions in your household or community?

Energy and Employment Opportunities: Assess how access to energy enables or limits livelihood opportunities, especially for people with disabilities.

- How does energy access affect your ability to pursue work or income-generating activities?
- Have energy-related challenges impacted your household's financial situation?

Affordability of Energy Solutions: Explore the economic burden of energy costs and how this differs across income levels and genders.

- How much of your household income is spent on electricity or cooking fuel?
- Do you face financial challenges in upgrading to more efficient or sustainable energy options?

Technology Adoption and Digital Inclusion: With the rise of digital platforms, assess the availability and reliability of energy to power devices essential for education, work, or telehealth.

- Do you have reliable electricity to power devices like phones, computers, or tablets for education or work?
- How has your energy access affected your ability to use digital tools or online services?

Barriers to Adoption: Explore the challenges in adopting and maintaining new energy technologies (e.g., cost, technical support).

- What barriers do you face in adopting newer energy technologies or appliances?
- How confident are you in accessing technical support for energy-related devices?

Policy Awareness and Advocacy: Investigate awareness of government subsidies or energy programs targeted at people with disabilities.

- Are you aware of any government programs or subsidies that help people with disabilities access affordable energy?
- Have you applied for or benefited from such programs? What was your experience?
- Have you been involved in any advocacy efforts to improve energy access for people with disabilities?
- How can government or NGOs better engage with people with disabilities in policy-making processes?

Safety and Security: Explore safety concerns related to energy use, especially in cooking or operating assistive devices and community spaces.

- Have you ever experienced safety risks related to cooking fuels or energy devices?
- Are there any safety features or adaptations you wish were available in your household energy setup?
- Does the lack of public lighting affect your mobility or safety in your community?
- Are there any safety measures your community has taken to improve energy access in public spaces?

Social Inclusion and Community Support: Explore collective or community-driven energy solutions that benefit people with disabilities.

- Are there any community initiatives to improve energy access for people with disabilities?
- How well does your community support inclusive energy practices?
- Do you receive any support from neighbors, friends, or community groups in managing energy needs?
- How do social attitudes toward disability influence the support you get for energy-related challenges?

Appendix D: Semi-structured interview questions for professionals (2): government and institutional officials

Semi-structured interview questions for professionals (2): government and institutional officials

- Tell us about yourself

1. Policy and Implementation

- What policies or programs does your department have in place to ensure affordable, reliable electricity for people with disabilities?
- How do you monitor the effectiveness of these programs?

2. Cooking Fuels and Clean Energy

- Are there any government subsidies or initiatives to promote cleaner cooking fuels for vulnerable populations, including people with disabilities?
- How accessible are these programs to urban and rural households?

3. Adaptations and Infrastructure

- What steps has your department taken to make energy infrastructure more accessible for people with disabilities?
- Are there any guidelines for public and private spaces to ensure inclusivity in energy access?

4. Socio-cultural

- How do you address socio-cultural barriers that might affect the uptake of energy solutions by people with disabilities?
- Are there any community engagement or awareness programs to promote inclusive energy access?

5. Gender-Inclusive Policies

- How do government policies ensure equitable energy access for people with disabilities across different genders?
- Are there specific programs aimed at supporting women with disabilities in accessing affordable, reliable electricity and cleaner cooking fuels?

6. Gender and Energy Infrastructure

- Do you consider the unique needs of women with disabilities and non-binary individuals with disabilities when designing energy infrastructure (e.g., public lighting, household connections)?
- How do you address gender-based safety concerns related to energy access (e.g., safety in using public charging stations or fetching fuel)?

7. Gender Roles in Energy Decision-Making

- What efforts are made to include women in household and community decision-making regarding energy solutions?
- Are there initiatives to train women in the maintenance or use of energy technologies, such as solar panels or electric cooking devices?

Appendix E: PhotoVoice Guidelines for People with Disability

PhotoVoice guide: Access to energy for people with disabilities in Ahmedabad, India

People with disabilities in the Ahmedabad area will be asked to think about their energy use at home during a home visit by the team. During this PhotoVoice exercise the research team will stay with the people with disabilities. The exercise is intended to be led or driven by the person with a disability entirely, with the team simply following their direction.

Step one: Camera training

At the start of the exercise, explore whether the person with a disability can hold and use the camera and would like to take their own photos, or whether they would like the team to take the photos for them. Accordingly, the research team will take time to train the person with a disability to use a camera as needed.

Step two: Consent phase one

Explain the task to the person with a disability and seek their consent to participate in the task, recording this verbally or by writing or by thumbprint on the consent form.

Step three: Photography

The photography is to be led by a person with a disability as much as possible, and they should direct the photos to be taken. For this exercise, they will be asked to take 5 photos that make them happy about their energy access and use, and 5 photos that show where they face more challenges.

Topics of interest could be prompted- if needed- through informal discussions at the start, and may include:

- Cooking and use of different types of stoves/devices
- Using electricity to use assistive technology/devices
- Using technology they enjoy using
- Measures they might take to save energy

Step four: Follow-up, story capture, and consent phase two

The photos will then be printed and a follow-up meeting with each person with a disability will be set up on another day. During the meeting, the printed photos will be shown to the person with a disability, and the person with a disability will be asked to rank the photographs according to most to least important for them. The person with a disability will also be asked to tell a short story about the photographs they have ranked, which will be directly quoted and used as a caption. This is to ensure that the photos reflect their 'voices'. The captions will be written down verbatim as short stories and the stories will be presented with the photos in any form of writing up, and may include a few sentences within the quote. It may be an idea to take a laptop and type these next to the soft copy of the photos, ranking them in order in a word document.

Seek their consent to use the photos in write-ups, and attribute the photos to their real names as per PhotoVoice conventions or ask them to provide a different name, recording this verbally or by writing or

by thumbprint on the consent form. Thank the participants with the gift of cutlery/cooking vessel and a copy of the printed photos to keep.

Appendix F: Consent form for PhotoVoice: People with Disabilities

Consent form for PhotoVoice: People with Disabilities

You have taken photos of your experiences of using energy as a person with a disability. We have printed these photos. Today we look at these photos together. I will ask you some questions about why you took these photos. We will then look at all the photos together, and you will put them in order of what you feel represents the most to least important issue you have photographed.

You will be shown all the photos taken and can keep copies of the photos you take. If there are any photos that you don't want us to use, you don't need to explain why and we won't use them. This will not affect your relationship with Prabhat or any future support that you might get.

You will own the copyright on the digital images. This means you have the right to say how they will be used. It also means that when they are used, you will always be acknowledged as the photographer. Remember, this means that people will know you took the photos and what you tell me about them. If you do not want people to be able to identify you, we can put a fake name next to your photos and words.

What are the possible benefits?

You will get copies of the photos you have taken. We cannot promise that the study will help you, but the information we get from the study will help our knowledge and understanding of the issues.

Instructions for fieldworkers:

1. *Ensure the participant understands what it means to have their face blurred or not in a photo, show the participant a photo of a person without their face blurred and the same photo of the person with their face blurred.*
2. *When you ask for consent to put the participant's photos in blogs and publications, explain that this means that people they have never met in India and worldwide can see their photo and the caption. Ask them if they would be comfortable if someone who may or may not know the participant saw the photo. If they are not, they might not want their photos used online, in exhibitions or in publications.*
3. *When you ask the participant if they want their real name credited to the photos, make sure they understand this means they can be identified.*

Remind the participant that we will not share photos that depict their face.

I (insert name) _____ understand that I retain copyright of my photographs but give permission for Amita Bhakta and Prabhat Education Foundation to retain copies of the images for use as consented to in the list below:

CONSENT CHECKLIST

I am happy for Amita Bhakta to use my photographs in the following ways:	YES <input checked="" type="checkbox"/>	NO <input checked="" type="checkbox"/>
With my face blurred		
Without my face blurred		
As part of this study report		

Appendix G: Overall Study Consent Form

Study project: Access to energy for people with disabilities in Ahmedabad Overall study consent form for people with disabilities

Instructions for field workers:

1. Ask the individual if they remember the purpose of the study and why they have been asked to participate. If they need refreshing, refer to the 'Participant Information Sheet'. Remind the individual that their participation is voluntary.
2. Remind the individual that they have a right to withdraw at any time.

Please tick and sign or thumbprint as appropriate:

I, (insert name) _____ have read or have had the participant information sheet read to me and consent to the following:

Consent for	✓ As appropriate
Participating in this study on 'Access to energy for people with disabilities in Ahmedabad	
Participating in an interview	
Having words that I say included in a report or other publications included with a different name to mine	
Participating in a PhotoVoice activity where we take photos	
Participating in a drawing activity	
Having my drawings featured in publications	
Participating in a survey	
Participating in a story telling exercise	

Name: _____

Location: _____

Sign/thumbprint: _____

Date: _____

Appendix H: Participant Information Sheet – PwDs

Research project: Access to energy for people with disabilities in Ahmedabad

Participant information sheet for people with disabilities

Research team: Dr. Amita Bhakta (Independent consultant, UK), Prabhat Education Foundation (Ahmedabad)

To be translated into Gujarati

What is the purpose of the study?

This research is being conducted to understand the experiences of people with disabilities in Ahmedabad of accessing and using energy to meet their needs, such as cooking and using assistive devices. We are speaking to people with disabilities in the Ahmedabad area to identify recommendations to meet their energy needs.

Who is doing this research and why?

This research is being done by Dr. Amita Bhakta, who is an independent consultant from the UK, and Prabhat Education Foundation. This research is being conducted for the Modern Energy Cooking Services programme at Loughborough University, UK.

Who can take part in the research?

You have been invited to participate in this research because you have been recognised as an adult with a disability who can provide valuable insights into this study on energy access.

Any person can take part in the research who:

- Has a physical or intellectual disability
- Is aged over 18 years
- Is living in the Ahmedabad area of Gujarat
- Is able to communicate, either verbally or through sign language, in Gujarati and/or Hindi and/or English
- Is able to hold a crayon and draw
- Is able to hold and use, or direct another person to use, a 'point and shoot' digital camera to take a picture

What will I be asked to do?

As part of the research you will be asked to take part in one or more activities so that we can understand your experiences of using energy. We may ask you to:

- Take part in an interview with members of the team
- Take part in a survey
- Draw some pictures of how you feel about using energy, such as for cooking or using electricity, and tell us about your drawings
- Take some photos, or ask us to take some photos, which show us how you use energy, such as for cooking or using electricity, and how it makes you feel. You will then be asked to explain to us what each of the photos is showing
- Tell us a short story about your experiences of using energy

What benefits do I get in participating?

In exchange for taking part in this research, we will give you some cutlery or cooking vessels to keep as a gift. If you take part in the photo exercise, we will give you a copy of the printed photos to keep.

Will my relationship with Prabhat Education Foundation be affected by my participating or not participating?

No, your relationship with Prabhat Education Foundation will not be affected whether you decide to participate or not participate.

Do I have to take part?

No. It is up to you to decide to take part or not. If you don't want to take part, that's ok. This will not affect any future support you receive. If there are any photos or drawings that you don't want us to use, you don't need to explain why and we won't use them.

Once I take part in the research, can I change my mind?

Yes! After you have understood the information on this sheet, we will ask for your verbal consent to take part. However if before, during or after the sessions you wish to withdraw from the study please just contact Amita Bhakta or Prabhat Education Foundation. You can withdraw within a time period of up to 14 days after we meet, for any reason and you will not be asked to explain your reasons for withdrawing. You just need to tell the team that you don't want to be in the study anymore. You can stop at any time. You can carry on after a break, or you can withdraw from the study. Our notes and recordings from our discussion will be destroyed. This will not affect any future support that you receive.

Are there any risks in participating?

There is a risk that you may feel uncomfortable or distressed when discussing certain issues. If you do so, please tell us immediately and we will not talk about them. You can ask us to stop at any time. If you feel tired at any point in the data collection process, please tell us and we will stop.

Will my taking part in this study be kept confidential?

Your participation in this study will be kept confidential. If you take part in PhotoVoice and drawings, we will give you the option of using your name to attribute photos and drawings, or to come up with a different name. Otherwise, your identity will be made anonymous and in the research reports you will be given a different name. All of your data will be stored safely on a password protected computer. This data will be destroyed after two years.

I have more questions, who should I contact?

If you have any further questions, please contact Prabhat Education Foundation.

What will happen to the results of the study?

The results of the study will be used to write blogs, a report, an academic journal paper, and host exhibitions of the photos in Ahmedabad and Delhi.

Appendix I: Participant Information Sheet – Professionals

Research project: Access to energy for people with disabilities in Ahmedabad Participant information sheet for professionals (Government institutions, Disabled People's Organisations)

Research team: Dr. Amita Bhakta (Independent consultant, UK), Prabhat Education Foundation (Ahmedabad)

To be translated into Gujarati

What is the purpose of the study?

This research is being conducted to understand the experiences of people with disabilities in Ahmedabad of accessing and using energy to meet their needs, such as cooking and using assistive devices. We are speaking to professionals in the Ahmedabad area to identify recommendations to meet the energy needs of people with disabilities.

Who is doing this research and why?

This research is being done by Dr. Amita Bhakta, who is an independent consultant from the UK, and Prabhat Education Foundation. This research is being conducted for the Modern Energy Cooking Services programme at Loughborough University, UK.

Who can take part in the research?

You have been invited to participate in this research because you have been recognised as a professional who can provide valuable insights into this study on energy access. Any professional from the Ahmedabad area with expertise in energy, disability and gender and social inclusion, who is working for government institutions and disability organisations.

What will I be asked to do?

As part of the research you will be asked to take part in a semi-structured interview which will be recorded on a digital recorder.

What benefits do I get in participating?

While there is no direct benefit to you, your insights will contribute to understanding the challenges and opportunities in energy access for people with disabilities. The findings may inform policy and improve energy services in your community.

Will my relationship with Prabhat Education Foundation be affected by my participating or not participating?

No, your relationship with Prabhat Education Foundation will not be affected whether you decide to participate or not participate.

Do I have to take part?

No. It is up to you to decide to take part or not. If you don't want to take part, that's ok.

Once I take part in the research, can I change my mind?

Yes! After you have understood the information on this sheet, we will ask for your verbal consent to take part. However if at any time, before, during or after the sessions you wish to withdraw from the study please just contact Amita Bhakta or Prabhat Education Foundation. You can withdraw within a time period of up to 14 days after we meet, for any reason and you will not be asked to explain your reasons for withdrawing. You just need to tell the team that you don't want to be in the study anymore. You can stop at any time. You can carry on after a break, or you can withdraw from the study. Our notes and recordings from our discussion will be destroyed.

Are there any risks in participating?

There are no risks to individuals participating in this research.

Will my taking part in this study be kept confidential?

Your participation in this study will be kept confidential. Your identity will be made anonymous and in the research reports you will be given a different name. All of your data will be stored safely on a password protected computer. This data will be destroyed after two years.

I have more questions, who should I contact?

If you have any further questions, please contact Prabhat Education Foundation

What will happen to the results of the study?

The results of the study will be used to write blogs, a report, an academic journal paper, and host exhibitions of the photos in Ahmedabad and Delhi.

Appendix J: Participant Information Sheet – Parents and Caregivers

Research project: Access to energy for people with disabilities in Ahmedabad

Participant information sheet for parents and caregivers

Research team: Dr. Amita Bhakta (Independent consultant, UK), Prabhat Education Foundation (Ahmedabad)

To be translated into Gujarati

What is the purpose of the study?

This research is being conducted to understand the experiences of people with disabilities in Ahmedabad of accessing and using energy to meet their needs, such as cooking and using assistive devices. We are speaking to parents and caregivers of people with disabilities in the Ahmedabad area to identify recommendations to meet the energy needs of people with disabilities.

Who is doing this research and why?

This research is being done by Dr. Amita Bhakta, who is an independent consultant from the UK, and Prabhat Education Foundation. This research is being conducted for the Modern Energy Cooking Services programme at Loughborough University, UK.

Who can take part in the research?

Any parent or caregiver aged over 18 of a person with a disability living in the Ahmedabad area.

What will I be asked to do?

As part of the research you will be asked to take part in a semi-structured interview which will be recorded on a digital recorder.

Will my relationship with Prabhat Education Foundation be affected by my participating or not participating?

No, your relationship with Prabhat Education Foundation will not be affected whether you decide to participate or not participate.

Do I have to take part?

No. It is up to you to decide to take part or not. If you don't want to take part, that's ok. This will not affect any future support you receive.

Once I take part in the research, can I change my mind?

Yes! After you have understood the information on this sheet, we will ask for your verbal consent to take part. However if at any time, before, during or after the sessions you wish to withdraw from the study please just contact Amita Bhakta or Prabhat Education Foundation. You can withdraw at any time, for any reason and you will not be asked to explain your reasons

for withdrawing. You just need to tell the team that you don't want to be in the study anymore. You can stop at any time. You can carry on after a break, or you can withdraw from the study. Our notes and recordings from our discussion will be destroyed.

Are there any risks in participating?

There are no risks to individuals participating in this research.

Will my taking part in this study be kept confidential?

Your participation in this study will be kept confidential. Your identity will be made anonymous and in the research reports you will be given a different name. All of your data will be stored safely on a password protected computer. This data will be destroyed after two years.

I have more questions, who should I contact?

If you have any further questions, please contact Prabhat Education Foundation.

What will happen to the results of the study?

The results of the study will be used to write blogs, a report, an academic journal paper, and host exhibitions of the photos in Ahmedabad and Delhi.

What if I am not happy with the way the research is conducted?

Please contact members of the Prabhat team who will forward your complaint to Dr. Amita Bhakta.

Appendix K: Energy access survey multi-tier framework – Survey Form

Survey: Access to Energy in Households with Persons with Disabilities

This survey aims to understand how households with persons with disabilities in Ahmedabad access and use energy. It focuses on energy needs, challenges, and the role of assistive devices in daily life.

Section 1: Background Information

1. Respondent Details

- Age:
- Gender:
- Location (Ward/Area):

Disability Type (optional, mark all that apply):

- Visual impairment
- Hearing impairment
- Physical impairment
- Intellectual disability
- Multiple disabilities
- Other:

2. Do you or any household member use assistive devices?

- Yes
- No

3. If yes, please specify:

- Wheelchair
- Crutches/Walking Stick
- Hearing Aid
- Visual Aid (e.g., glasses, magnifiers, screen readers)
- Communication Devices (e.g., AAC boards, speech devices)
- Prosthetic Limbs
- Orthotic Devices (e.g., braces, splints)
- Electric Mobility Devices (e.g., motorized wheelchair, scooter)
- Medical Devices (e.g., oxygen concentrator, CPAP machine)
- Other (please specify):

4. What is your household's main source of income?

- Employment
- Business
- Pension
- Other:

5. What is your typical monthly household income (in INR)?

- Less than ₹5,000
 - ₹5,000 - ₹10,000
 - ₹10,001 - ₹20,000
 - ₹20,001 - ₹30,000
 - ₹30,001 - ₹50,000
 - More than ₹50,000
-

Section 2: Electricity Access and Use

6. How many hours of electricity do you typically have during the day?

- Less than 4 hours
- 4-8 hours
- 8-16 hours
- 16-22 hours
- 22+ hours

7. How many hours of electricity do you typically have in the evening (after sunset)?

- Less than 2 hours
- 2 hours or more
- Other, Specify:

8. How often is your electricity supply disrupted?

- Daily
- 2-4 days a week
- Once a week
- Never

9. How is your household connected to electricity?

- Grid electrified
- Disconnected from the grid
- Off-grid sources only
- Unelectrified
- Other, Specify:

10. How do you pay for your household electricity?

- Monthly bills
- Prepaid meter
- Informal arrangements
- Other:

11. Do you have a functional electricity meter?

- Yes
- No

12. How much of your monthly household expenditure is spent on electricity?

- Less than ₹500
- ₹500 - ₹1,000
- ₹1,001 - ₹2,000
- ₹2,001 - ₹3,000
- ₹3,001 - ₹5,000
- More than ₹5,000

13. What do you currently power at home with your electricity? (Select all that apply)

- Lighting
- Communication devices (mobile phones, radios)
- Entertainment devices (TV, computer)
- Cooling/heating (fans, AC, heaters)
- Other appliances:

Section 3: Cooking and Fuel Use

14. Which fuels do you use for cooking? (Select all that apply)

- Wood (collected)
- Wood (purchased)
- Charcoal
- LPG
- Electricity
- Other:

15. How long does your primary cooking fuel (e.g., LPG cylinder, collected wood) typically last?

- Less than 1 week
- 1-2 weeks

- 3-4 weeks
- 1-2 months
- More than 2 months

16. How much time do you spend obtaining cooking fuel (e.g., refilling LPG, collecting wood, etc.)?

- Less than 30 minutes
- 30 minutes - 1 hour
- 1-2 hours
- More than 2 hours

17. Do you face challenges in obtaining your cooking fuel?

- Yes
- No

If yes, please describe briefly:

Pradhan Mantri Ujjwala Yojana (PMUY):

18. Are you aware of the Pradhan Mantri Ujjwala Yojana (PMUY), which provides subsidized LPG connections to economically weaker households?

- Yes
- No

19. If yes, have you or your family availed of an LPG connection under this scheme?

- Yes
- No

20. If you have availed of a connection under the PMUY, how has it impacted your household energy use and cooking practices?

- Reduced dependence on traditional fuels (e.g., wood, coal)
- Improved health due to less indoor pollution
- More time saved in cooking
- Other (please specify): _____

21. What challenges, if any, have you faced in continuing to use the LPG connection?

- High refill cost
- Limited access to refill centers
- Lack of awareness about subsidy benefits
- Other (please specify): _____

Other energy-related Government schemes for people with disabilities:

22. Are you aware of any government schemes that focus on providing energy access or subsidies to people with disabilities?

- Yes
- No

23. If yes, please specify the scheme(s):

- Pradhan Mantri Sahaj Bijli Har Ghar Yojana (Saubhagya)
- Solar Charkha Mission
- Subsidized Solar Home Systems or Lanterns
- State-Specific Disability Energy Subsidies (please specify): _____
- Other (please specify): _____

24. Have you availed of any energy-related schemes specifically designed or adapted for people with disabilities?

- Yes
- No

25. If yes, how have these schemes helped in addressing your energy needs?

- Improved accessibility to electricity or LPG
- Reduced energy costs through subsidies
- Enhanced mobility or access to assistive devices powered by renewable energy
- Other (please specify): _____

26. What challenges, if any, did you face in availing of these schemes?

- Lack of awareness about the schemes
- Complex application processes
- Limited availability of benefits in your area
- Inadequate adaptations for disability-specific needs
- Other (please specify): _____

Section 4: Disability-Specific Energy Needs

27. If you use assistive devices requiring electricity, how often do you have enough electricity to charge them?

- Always whenever needed
- Most of the time
- Some of the time
- Never

28. How much time per day do you spend at home using electricity as a result of your disability?

- Less than 6 hours
- 6-12 hours
- 12-18 hours
- 18-24 hours

29. Do you feel that your household spends more on electricity due to disability-related energy needs?

- Yes
- No

30. Do you have any dietary requirements due to your disability?

- Yes
- No

31. If yes, to what extent does this impact overall energy use in your household?

- No impact
 - Minimal impact
 - Moderate impact
 - Significant impact
-

Bibliography

Bhakta A, Brown E, and Groce N (2024) 'Clean cooking for every 'body': Including people with disabilities in modern energy cooking services in the global south' *Energy Research and Social Science* 108 (10399)

Bhatt, K., Bhakta, A., Keshavani, K, and Silakari, P. (2025) 'Energy, Inclusion and Everyday Life: The untold energy stories of people with disabilities in Ahmedabad' <https://mecs.org.uk/blog/energy-inclusion-and-everyday-life-the-untold-energy-stories-of-people-with-disabilities-through-photovoice-in-ahmedabad/> [Accessed: 21/05/2025]

Census (2011) Government of India

Center for Water and Sanitation (CWAS), CDRF, CEPT University (2014) *Ahmedabad Slum Free City Action Plan Executive Summary* Ahmedabad: CEPT Research and Development Foundation

Independent Research Ethics Committee <https://www.irec.org.uk/> [Accessed: 21/05/2025]

International Energy Agency, IRENA, UNSD, World Bank, WHO. (2024). *Tracking SDG 7: The Energy Progress Report*. World Bank, Washington DC.

Keshavani, K. (2025) 'Visual Voices: Using Drawing to Understand Disability and Energy in Ahmedabad, India' <https://mecs.org.uk/blog/visual-voices-using-drawing-to-understand-disability-and-energy-in-ahmedabad-india/> [Accessed: 21/05/2025]

National Family Health Survey (NFHS - 5), 2019–21 (2021)

Pattnaik S, Murmu J, Agrawal R, Rehman T, Kanungo S and Pati S (2023) 'Prevalence, pattern and determinants of disabilities in India: Insights from NFHS-5 (2019–21)' *Frontiers in Public Health* 11:1036499. doi: 10.3389/fpubh.2023.1036499

United Nations (2018) Realisation of the Sustainable Development Goals by, for and with persons with disabilities: UN Flagship Report on Disability and Development New York: UN