

Can Market Mechanisms Facilitate Energy Access for People Living in Extreme Poverty?

Part 1: Understanding the Relationship Between Energy Access and Extreme Poverty

Appendix 7.2c

Energy Access among People Living in Extreme Poverty in Nepal with a Focus on Women and Girls

1. Introduction

This review is one of a series of six,¹ looking at energy access for people living in extreme poverty in specific country contexts.² It has been carried out as part of a wider study entitled ‘Can Market Mechanisms Facilitate Energy Access for People Living in Extreme Poverty?’ under the Transforming Energy Access programme. Nepal was chosen as a country in the Indo-Pacific, where extreme poverty rates are relatively low compared with sub-Saharan Africa but numbers of people living in extreme poverty remain relatively high compared to other Indo-Pacific countries, together with availability of relevant information.

Each of the reviews also looks at issues around energy access for a specific demographic group who experience differential levels of extreme poverty or lack of energy access; have distinctive energy needs; and/or face distinct barriers to achieving energy access. This review looks specifically at extreme poverty and energy access among women and girls. This group was chosen as the focus in Nepal to explore the effects of unequal gender relations and their impact in the context of continuing low levels of access to clean cooking energy.

Some of the key findings from the research include:

- **People living in extreme poverty in Nepal have significantly lower levels of energy access than the rest of the population.** We estimate that about 0.28 million people living in extreme poverty remain without electricity access and ~0.9 million have no access to clean cooking energy.
- **Cost is the main reported obstacle to adoption of solar home systems (SHS) and clean cookstoves by people living in extreme poverty in Nepal,** and the main obstacle after distance to grid connection. **The option to pay in instalments increases willingness to pay for energy access among people living in extreme poverty in Nepal,** bringing it broadly in line with the rest of the population.
- **Some 40% of people living in extreme poverty remained unwilling to pay for a SHS and 53% for an improved cookstove,** even if subsidized and paid in instalments. Other barriers will need to be overcome if all are to achieve energy access.
- There is some evidence that female headed households may have even lower levels of energy access than male headed households living in extreme poverty in Nepal. There are **more fundamental differences in the capacity for women and men to meet their energy needs in the context of unequal power dynamics within households,** which may also hamper market mechanisms’ reach to women and girls.

Information on the methodology used; definitions of terms and acronyms; and the sources referenced can be found in the report ‘Part 1: Understanding the Relationship Between Energy Access and Extreme Poverty’.

2. Country context

Nepal is a small, landlocked country located between the southern slopes of the Himalayas and the north of India (World Vision, 2015). Nepal has a population of approximately 29 million people (MoFA, 2023). Until Nepal became a secular republic in May 2008, the country was unique as the only official Hindu state in the world (ibid).



Figure 1: Map of Nepal (Source: CIA, 2023).

Just over 81% of Nepal's population is Hindu, with 9% Buddhist and 4.4% Muslim (World Vision, 2015).

Nepal is a parliamentary democracy with a ceremonial President as Head of State and Prime Minister as Head of Government (USAID, 2022).

Nepal enacted a new constitution in 2015 with a federal structure of government designed to devolve power and authority to 753 local governments and seven provinces (ibid).

Nepal is one of the poorest and least developed countries in Asia. Agriculture provides a livelihood for 75% of the work force. Industrial activity mainly involves the processing of agricultural produce including jute, sugar, tobacco, and grains. Other industries include tourism, clothing and textiles, and cement and brick production. Money sent back from Nepali people working overseas (remittances) is also important for Nepal's economy (ibid).

3. Extreme poverty

Nepal's extreme poverty rate was 8.2% (2.2 million people) in 2010 (the last year survey data was collected) (World Bank, 2023a). Extreme poverty previously stood at 40.3% in 2003, indicating significant poverty reduction between 2003 and 2010. The poverty gap also declined between 2003 and 2010 from 11.5 to 1.6% (ibid). The extent of more recent progress is difficult to establish due to a lack of reporting. However, Nepal's multidimensional poverty rate fell by nearly half, from 30.1% in 2014 to 17.4% in 2019 (GoN, 2021), and its Human Development Index rose from 0.543 in 2010 to 0.602 in 2021 (UNDP, 2022). Therefore, monetary poverty is also likely to have fallen since 2010.

Although poverty has been falling in Nepal over the last two decades, regional inequalities have persisted with much higher levels of poverty in rural and mountainous areas, especially the mid-and-far-west regions (DFID, 2013). The World Bank (2023a) also reports that high vulnerability to extreme poverty and exposure to shocks remain significant challenges for many. Recent shocks include the Gorkha earthquake and fuel crisis in 2015, floods in 2017, landslides and the COVID-19 pandemic. The economic impacts of COVID-19 have included substantial job and income losses. This has been exacerbated by a weak labour market with a high proportion of informal and subsistence jobs and limited social assistance (ibid).

Based on regional changes in poverty rates over the period 2010 to 2023, we estimate an extreme poverty rate for Nepal of 3.1% in 2023 (World Bank, 2022 & Hadad et al, 2023). This represents 1 million people and, therefore, a significant decline in absolute terms since 2010.

4. Poverty among women and girls in Nepal

Gendered disaggregated data on income poverty in Nepal is limited. ICIMOD (2010) report that national survey data shows that female-headed households were on average less likely to be living below the national poverty line than their male-headed counterparts in 2003/04: 24% compared to 32%, respectively. This difference potentially reflects the fact that, on average, female-headed households received more remittances. In 2003/04, 65% of the female-headed households received remittances, in contrast to only 24% of male-headed households. This suggests that a decline in household income as a result of out-migration, a common practice for male members, can be offset by an increased flow of remittances. However, survey data did not differentiate between households where the male head was contributing through migration, and those in which there was no male head due to death, disappearance, or incapacity. Therefore, additional factors are likely to play a role (ibid).

More recently, Nepal's National Planning Commission found that multi-dimensional poverty was higher among women than among men in 2019 (2.3 million women compared to 1.9 million men) (GoN, 2021). This suggests that although income poverty may be lower for female-headed households, they may be more affected by non-monetary deprivations. This may include inequality in asset ownership; health outcomes (including greater exposure to health risks from traditional cooking, and child mortality); school attendance and years of schooling; nutrition; and access to basic services including water and sanitation. However, detailed analysis of potential causes is not provided (ibid).

Overall, it is not possible to conclude based on available evidence whether male or female-headed households, or women or men more generally, are more likely to live in extreme poverty in Nepal as of 2023. Findings support ICIMOD's (2010) view that a more comprehensive understanding of the gendered dimensions of poverty in Nepal is needed.

5. Energy access

Background

As of 2022, Nepal's total installed electricity generation capacity was 2,191 MW (Nepal Economic Forum, 2023). Currently, 96.2% of the installed capacity is from hydropower, 3.7% from thermal and 0.1% from solar plants. Hydropower mini grids are a key component of Nepal's electrification strategy for rural areas, led by the Alternative Energy Promotion Centre (AEPC), with limited use of off-grid solar (USAID, 2023). The AEPC provides subsidies covering 50% of capital costs for mini grids supported by small-hydropower projects (ranging from less than 10 kW to 1MW), including some larger projects connected to the national grid. Challenges have included under use of available capacity (including low consumption due to concerns about breakdowns in equipment); delays in accessing funding (especially loans to complement subsidies and grants); increasing vulnerability to changing rainfall patterns; and limited productive use of electricity including by small-scale enterprises and agricultural uses. These have been addressed to some extent by changes to AEPC's renewable subsidy policy: extending the list of eligible technologies (solar, wind and hybrid) and enabling greater access to credit via involvement of private developers (ibid).

Key policies and programmes

Nepal aims to achieve universal access to electricity and clean cooking by 2023/24. Efforts to increase energy access are guided by the Alternative Energy Promotion Centre (AEPC).

Key policies include:

Rural Energy Policy (2006) focused on rural poverty reduction and environmental conservation through grid extension (AEPC, 2023). It also includes awareness and promotional programmes to improve access to solar cookers and improved cookstoves.

The Renewable Energy Subsidy Policy (2016) aims to reduce dependence on traditional and imported energy and to increase access to renewable sources, especially for poor households (IEA, 2017). It involves a subsidy of 40% of the total cost of a range of off-grid technologies including mini/micro hydropower, improved water mills, solar energy (home systems, mini-grids, grid connected), biogas, biomass energy, wind energy and wind-solar hybrids. Credit will account for 30% of the subsidy, with the remaining 30% coming from private, communal, or household contributions (cash or in-kind) (ibid).

The Biomass Energy Strategy (2017) aims to support environmental conservation and to reduce indoor air pollution and dependence on LPG imports by increasing biogas production (AEPC, 2023). This includes use of municipal waste for generating energy.

The Water Resources White Paper (2018) aims to expand access to electricity and clean cooking to 100% of the population in five years.

The Second Nationally Determined Contribution to the Paris Agreement (2020) aims to increase the share of electric stoves to 25% and disseminate an additional 500,000 ICS and 200,000 household-scale biogas plants.

The 15th Five Year Plan (2020) aims to raise Nepal from a least developed to a middle-income country. It includes several energy access targets, including 20% electric cooking adoption and 100% electricity access by 2023/24 and establishing appropriate tariffs and standards for electric cooking (ibid).

Energy access levels

As of 2021, 90% of people in Nepal had access to electricity while 35% of the population had access to clean energy for cooking (IEA et al, 2023). This represents a slight increase since 2017 when 87% of the population had access to electricity and 31% to clean energy for cooking (ESMAP, 2023). Urban and rural electricity access rates are very similar, but only 22% of rural residents, compared to 63% of urban residents, have access to clean cooking energy (ibid).

When people were asked, as part of the Multi-Tier Framework (MTF) energy access diagnostic surveys carried out in 2017, what access they had to energy, only 31% of people living in extreme poverty had a grid connection (compared to 69% of the rest of the population) – see Fig 2.³ Conversely, 52% of people living in extreme poverty relied on off-grid electricity (split roughly evenly between mini/pico hydro and solar lighting) compared with 26% of the rest of the population. In rural areas only 19% of people living in extreme poverty had grid access. Overall, we estimate that 20% of people living in extreme poverty had no effective modern electricity access (i.e. did not have MTF tier 1 or higher access), compared with 6% of people with higher incomes.⁴

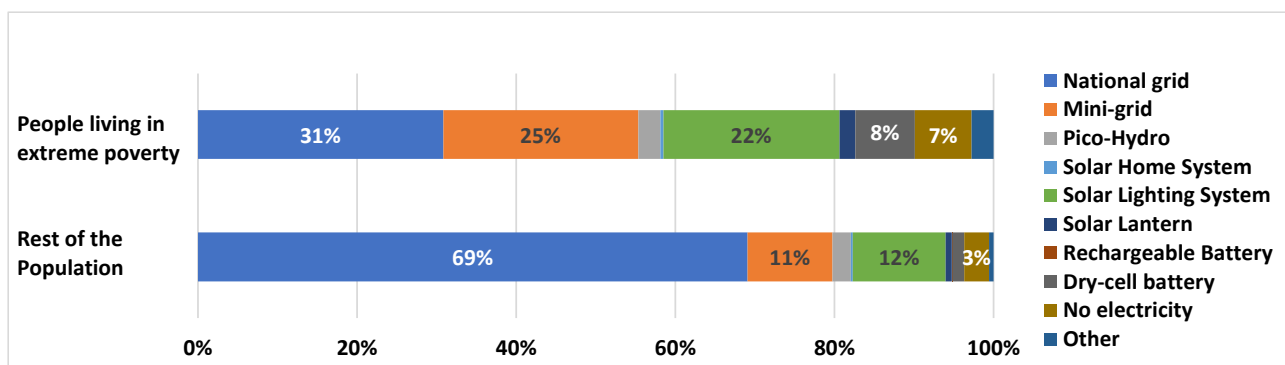


Figure 2: Electricity access by technology (based on data from EnergyDataInfo, 2023)

Based on the 90% general level of electricity access in 2021, reported through the SDG7 tracking process (IEA et al, 2023), and assuming that the ratio between lack of access among people living in extreme poverty and the whole population remains as estimated from the MTF survey data (i.e. 20%:7%), the percentage of people living in extreme poverty in Nepal who lack electricity access can be estimated at 29%, 0.28 million people.

Only about 5% of people living in extreme poverty, compared with 37% of the rest of the population, were using stoves burning clean fuels (primarily LPG) for cooking when the MTF survey was carried out in 2017 (see Fig 3).

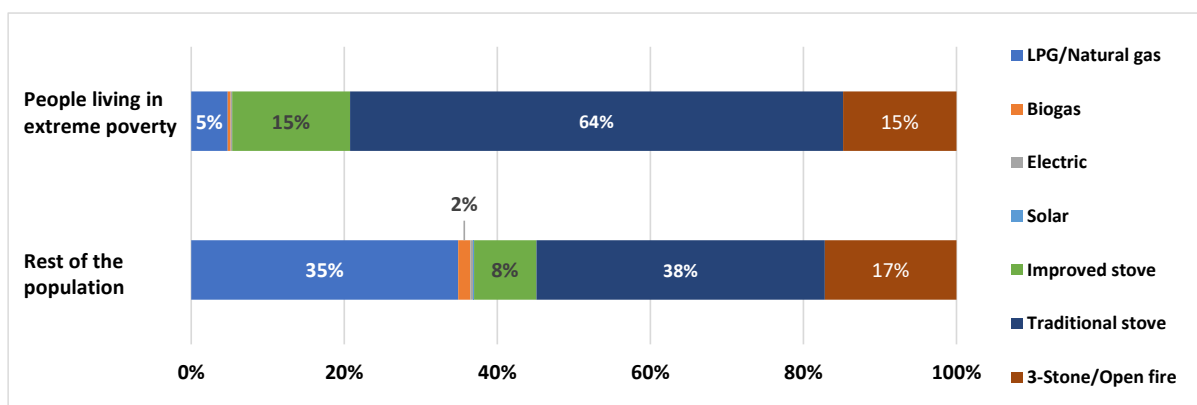


Figure 3: Cooking by stove type (based on data from EnergyDataInfo, 2023)

Most (79%) of people living in extreme poverty were using traditional stoves or cooking over 3-stone/open fires, as were 55% of the rest of the population. About 15% of people living in extreme poverty (and 8% of the rest of the population) used improved cookstoves.

Based on the 35% general level of clean cooking access in 2021, reported through the SDG7 tracking process (IEA et al, 2023), and assuming that the ratio between lack of access among people living in extreme poverty and the whole population remains as estimated from the MTF survey data (i.e. 95%:64%), the percentage of people living in extreme poverty in Nepal who lack electricity access can be estimated at 95%, 0.9 million people.

Energy access among women and girls

The World Bank's Energy Diagnostic Report for Nepal reports similar rates of electricity connection but higher levels of access to clean cooking for female-headed households compared to male-headed households (Pinto et al, 2019). Women head 18.2% of Nepalese homes, with the majority falling into the lowest quintile of family expenditure. (ibid).

Analysis of data from the MTF surveys in 2017 also shows that female headed households, overall, had very similar levels of electricity access to male headed households. However, female headed households living in extreme poverty had slightly lower levels of grid and mini-hydro access than other households in extreme poverty, and significantly fewer of them had solar lighting systems, instead relying on solar lanterns. Similarly, while a higher proportion of female-headed households overall were using clean cooking stoves, and fewer were using traditional stoves and 3-stone fires (indicating that when they have the resources, women prioritise clean cooking), female headed households in extreme poverty reported even lower access to clean and improved cookstoves than male headed households living in extreme poverty.⁵

Inequalities in access to energy between men and women in Nepal are likely to go beyond differences between female- and male-headed households and relate more to gendered energy needs, priorities and impacts, and men and women’s relative ability to address their energy needs in the context of unequal household power dynamics (see section 6 below).

6. Energy needs of people living in extreme poverty

As part of the MTF survey carried out in 2017, people in Nepal were asked about electrical appliances they would like to be able to use (EnergyDataInfo, 2023).

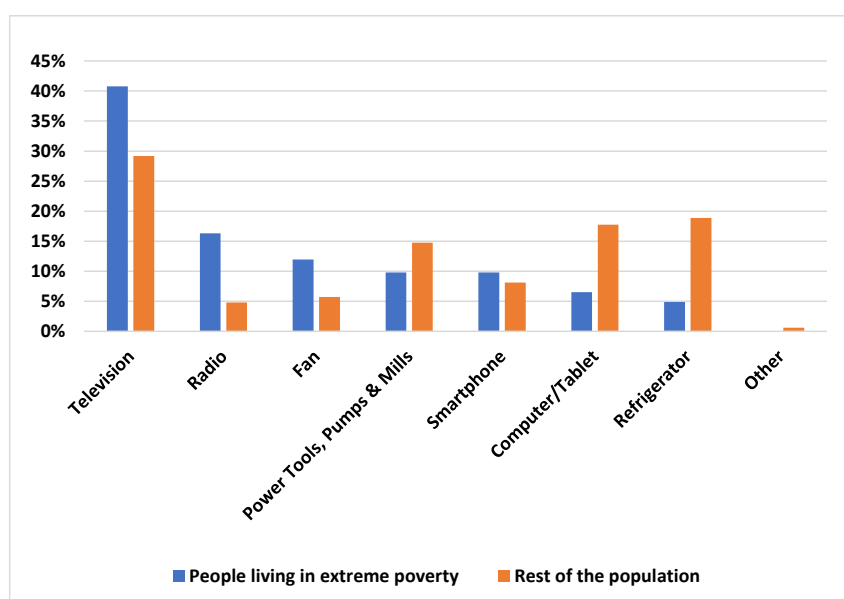


Figure 4: Additional appliances wanted (based on data from EnergyDataInfo, 2023)

Very similar percentages of people living in extreme poverty and the rest of the population said they wanted additional appliances, and similar numbers of requirements were flagged by people living in extreme poverty. Televisions and radios were the priority for most people living in extreme poverty, followed by fans and then power tools (see Fig 4). Some people living in extreme poverty wanted smartphones, tablets or computers, and a smaller percentage wanted refrigerators.

Overall, the pattern appears to be that, while communication and entertainment were a high priority for people across the income range, people living in extreme poverty are interested in a narrower set of energy uses and focussed on more basic, lower-power appliances.

Gender and energy needs

ADB (2018) reports that the energy needs and patterns of usage among men and women in Nepal differ. Men are typically more interested in the potential economic opportunities derived from energy access while women are more concerned about meeting household energy needs. This includes reducing drudgery through labour-saving devices such as electric mills (reflecting women’s greater role in food preparation), reducing health risks from traditional cooking through clean energy alternatives and improving educational outcomes through electric lighting (improving study conditions). Electric lighting within households and communities was also prioritised by women to improve personal safety and to provide greater flexibility to complete tasks according to when it best fits their schedule.

Activities outside the home such as agricultural work (including tending to fields and processing crops) are often split equally between men and women. There is, therefore, often equal demand for solar powered water pumps used in irrigation or devices used in agro-processing. However, an increasing trend of male migration away from rural areas is resulting in women having to meet both household and productive energy needs (ibid).

Importantly, the benefits of improved or modern energy that can be derived by women are often obstructed by structural barriers (Energia, 2021). For example, women reported that time saved by the use of energy appliances often goes to other household chores, adding to the burden that women already bear (ibid).

7. Affordability, willingness to pay and other barriers

People in Nepal were asked, as part of the MTF energy access diagnostic survey carried out in 2017, about their willingness to pay for energy access (EnergyDataInfo, 2023). Some people living in extreme poverty were willing to pay upfront for each of a grid connection, solar home system or improved cookstove (see Fig. 5).⁶ However, willingness to pay upfront for a grid connection or SHS was lower among people living in extreme poverty than among the rest of the population.

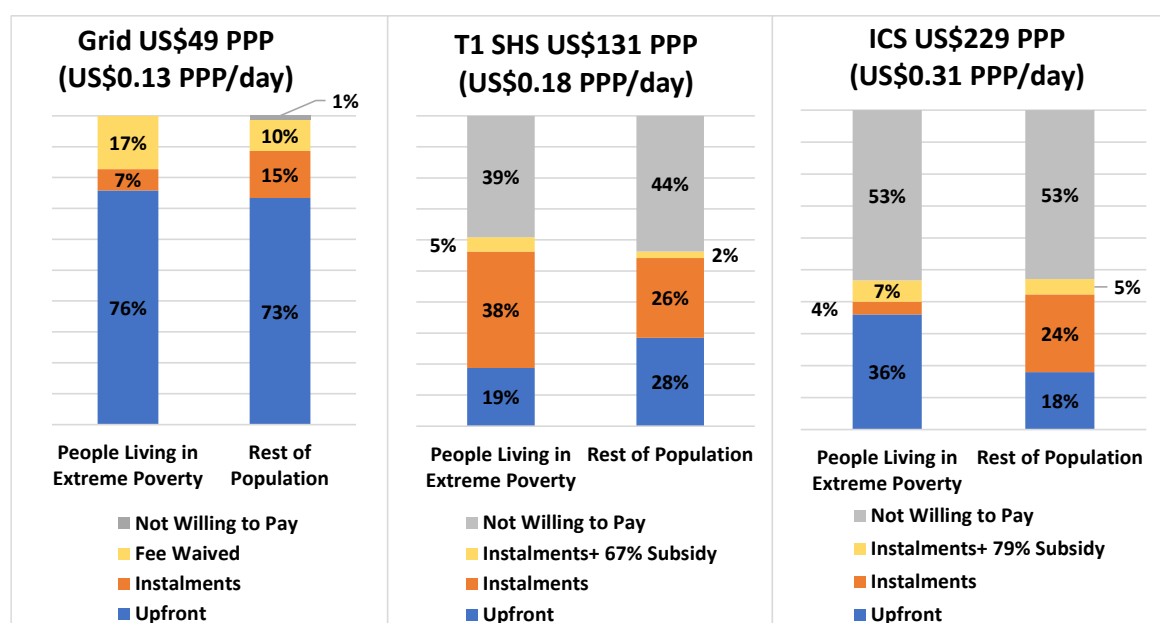


Figure 5: Willingness to pay for grid connection, solar home system or improved cookstove (based on data from EnergyDataInfo, 2023).

A higher percentage of people living in extreme poverty than the rest of the population were willing to pay upfront for an improved cookstove. It is not clear why this should be, but it is possible that the stove was not a desirable purchase for people on higher incomes.

The option to pay in instalments significantly increased willingness to pay for energy access among both people living in extreme poverty and those on higher incomes, bringing them broadly in line. Waiving the fee for grid connection and subsidizing the cost of a solar home system or improved cookstove further increased percentages of people willing to pay. Virtually all those asked were willing to connect to the grid on these terms, but ~40% of people living in extreme poverty (13% - 29%) remained unwilling to pay for a SHS, and over half for an improved cookstove.

Some 3% of people living in extreme poverty who had no grid connection were waiting to be connected (see Fig 6). Most (73%) were unable to connect because they lived too far from the grid. Apart from distance, cost was the main barrier to connection for people living in extreme poverty. Few (only ~1%) saw ongoing electricity costs as a barrier.

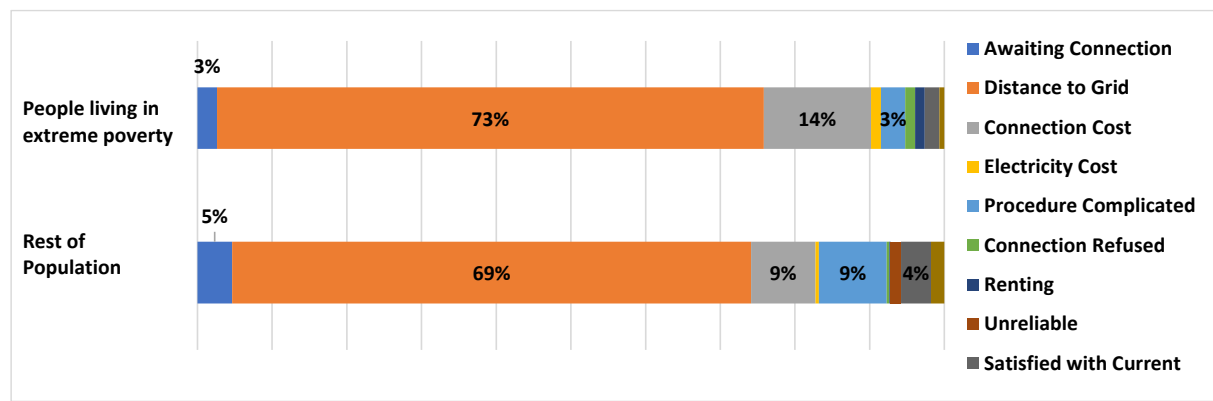


Figure 6: Barriers to grid connection (based on data from EnergyDataInfo, 2023)

Most of those living in extreme poverty who were unwilling to pay for a solar home system or improved cookstove said it was because of the cost (see Fig 7). By contrast, only 25% of the small number of people living in extreme poverty who were unwilling to pay for a grid connection, gave cost as the reason. (This may reflect the low grid connection price.)

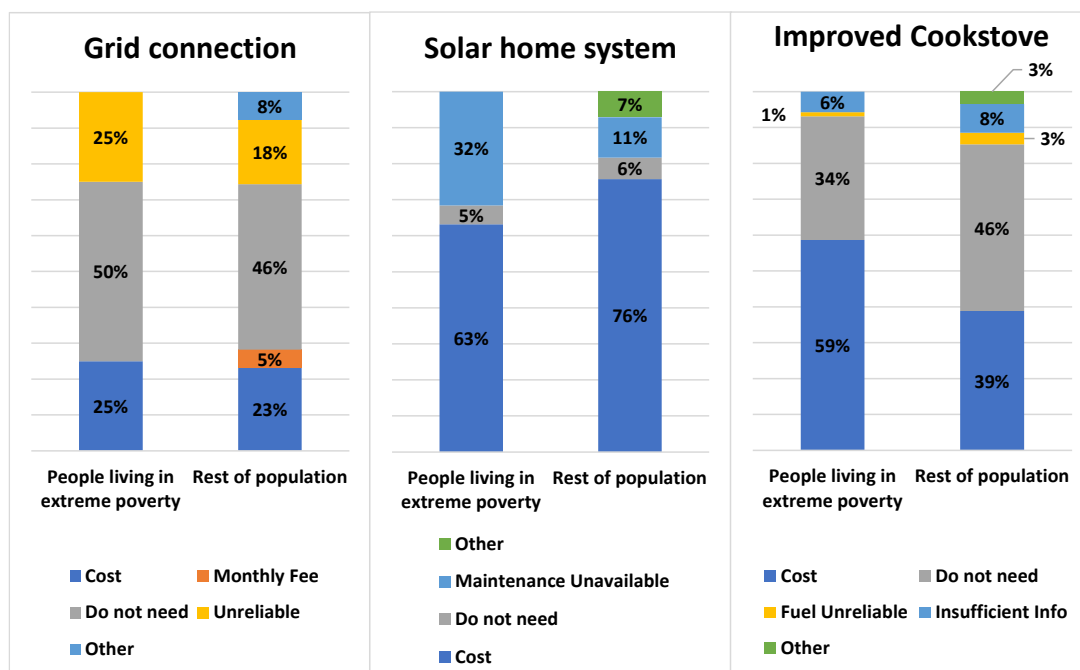


Figure 7: Reasons for unwillingness to pay for grid connection, solar home system and improved cookstove (based on data from EnergyDataInfo, 2023).

The main barrier to grid connection (apart from cost and distance) was the complexity of the application process. In addition, a relatively small number of people living in extreme poverty had been refused a connection or were unable to connect because they did not have their landlord's agreement to do so. (These were primarily issues for urban residents).

Some of the (small number of) people living in extreme poverty who were unwilling to pay for a grid connection gave unreliability as the reason. People living in extreme poverty were also unwilling to pay for a solar product because maintenance services were unavailable. A small percentage of people living in extreme poverty gave unreliability of fuel supply as the reason they would not pay for an improved cookstove.

Other sources note lack of compatibility between technologies and the socio-economic conditions of people living in extreme poverty is another barrier to energy access. For example, ADB (2018) report that biogas use in Nepal is limited to households with sufficient livestock and land, excluding those living in extreme poverty (ibid).

About 2% of those living in extreme poverty without a grid connection (and about half of the small number of people unwilling to pay for a connection) said they did not need it. Similarly, 5% of those unwilling to pay for a SHS, did not see any need for electricity. However, over a third of people living in extreme poverty who were unwilling to pay for an improved cookstove, said they did not need one and 6% said that they didn't have enough information.

Barriers to energy access among women and girls

Limited access to energy services is identified as a particular challenge affecting marginalised groups in Nepal including women and members of different castes (ADB, 2018).

Limited agency and decision-making power limits women's ability to influence energy access within households. ADB (2018) report that men are more likely to be responsible for decisions related to investment and adoption of technologies. Men from 'upper caste' groups in hill zones (Bahuns and Chhetris) tend to make decisions on energy investments for both economic and household activities. However, such dynamics are contextually varied. For

example, decision making is reported to be more equal among men and women in other groups such as the Janajatis (indigenous people). Nevertheless, ADB report that men are generally responsible for overseeing payments for energy in Nepal (ibid).

Limited participation of women and socially excluded groups also limits their ability to influence energy access for communities. For example, Energia (2021) report that staff involved in hydropower projects often consult a single household member on projects' activities and impacts. Typically, this is a man as men are considered responsible for household decision making (reflecting pre-existing gender norms and social inequalities). In addition, consultation is often based on a perceived direct stake in a project such as loss of land or livelihood. This tends to exclude women and lower castes, such as Dalits, as they have limited land ownership (despite working on affected land as sharecroppers and, therefore, being affected by project activities). Furthermore, when included in consultations, lower castes are often in the minority relative to politically stronger castes (ibid).

Women are sometimes unable to attend project consultations due to the time burden of other activities (reflecting inequalities in the allocation of household chores). This can create the perception that women are not interested in project activities leading to exclusion from future meetings. Furthermore, cultural attitudes can mean that women are unable or uncomfortable talking to male project staff. Physical remoteness limits decision making power and awareness of energy interventions. Consultations for energy projects tend to take place in market centres with the knock-on effect of limiting participation of groups living in remote, poorly connected areas who cannot travel to attend meetings (ibid).

8. Factors limiting market mechanism reach

Market mechanisms are intended to overcome affordability, and potentially other barriers, to energy access. However, certain factors may affect the capacity of those in extreme poverty to take up mechanism support (i.e. mechanism's reach to these groups).

Experience with financial support in general

People's experience with financial support is likely to influence willingness or ability to use market mechanisms for energy access. Some 53% of Nepal's adult population, but only 44% of those living in the poorest 40%, had an account at a financial institution in 2021 (World Bank, 2023b). For the whole population, account ownership was fairly even between men (56%) and women (50%) (ibid). The World Bank's Findex Database shows that barriers to account ownership include financial institutions being too far away (affecting 12% of survey respondents); financial services being too expensive (9%); insufficient funds (38%); lack of necessary documentation (11%); lack of trust in financial institutions (5%); religious reasons (3%); and because a family member already has an account (17%) (ibid).⁷ Those living in extreme poverty are likely to be more affected by key barriers to financial inclusion such as high cost of financial services and insufficient funds to open accounts. Limited experience with financial support in general may limit willingness or ability to use market mechanisms for energy access.

Levels of general and financial literacy

General and financial literacy are likely to affect the extent to which people in extreme poverty can understand and derive benefit from market mechanisms. Nepal's national literacy rate was 64.66% of the adult population in 2023, compared to a global average of 86.9% (wisevoter, 2023). Financial literacy is especially low at only 18% of the adult population in 2014 (S&P, 2014).⁸ Barriers to education are likely to affect those in extreme poverty to a greater extent than the wider population (Global Citizen, 2020). This suggests

that additional measures to improve understanding of how market mechanisms work are required for those in extreme poverty to ensure that benefits are obtained.

Experience borrowing from financial institutions

Experience borrowing from formal financial institutions may affect people's willingness to engage with market mechanisms. The World Bank (2023b) report that only 15% of adults in the poorest 40% of Nepal's population had borrowed any money from a formal financial institution or using a mobile money account in 2021. A higher share (45%) had borrowed from family or friends (ibid). Limited engagement with financial institutions, either saving or borrowing with them, will mean that people are less likely to have credit histories or records of regular savings, potentially hindering the implementation of business models involving repayments. It may also create reluctance to engage with mechanisms where borrowing is involved.

PAYGO infrastructure

PAYGo mechanisms typically involve payments via mobile credit (by sending a text message) (IRENA, 2020). Therefore, their reach is primarily dependent on mobile phone ownership and network coverage. Mobile money account ownership may also influence the ease in which people can engage with this mechanism (ibid). Conditions for PAYGo uptake in Nepal are fairly good for the population as a whole but those living in extreme poverty may face challenges. Around 92% of the population were covered by a 2G network in 2019 (mAccess, 2023) and 80% owned a mobile phone in 2021 (World Bank, 2023b). However, only 3% of adults in the poorest 40% of the population had a mobile money account (ibid). This suggests that those living in extreme poverty are likely to struggle more to adopt PAYGo for energy access.

Market mechanism reach to women

Many of the factors which hamper men's access to market mechanisms in Nepal affect women even more acutely. Data for 2021 shows that literacy is lower for women (63.3%) than for men (81%) (World Bank, 2023c), as is financial literacy (S&P, 2014), likely reflecting gender norms which deter female education. Furthermore, experience borrowing from a financial institution or using mobile money, across the population as a whole, is slightly lower among women (13%) than among men (17%) (World Bank, 2023b). Women also face slightly harder conditions for adopting PAYGo. LeFevre et al (2020) report a significant gender gap in mobile phone ownership with around 89% of men owning a mobile in 2020 but only 73% of women. In addition, for the population as a whole, mobile money account ownership was higher for men (9%) than for women (4%) in 2021 (World Bank, 2023b).

In addition to these factors, women face unique challenges in accessing financial services and energy access interventions that are also likely to hamper the reach of market mechanisms. Gender norms and roles mean that women are responsible for most household chores, including preparing and cooking meals and childcare (Energia, 2021). This is likely to limit the time available for women to engage with market mechanism providers. Women can also feel uncomfortable communicating with male staff involved in energy access interventions including providers of market mechanisms (ADB, 2018).

Gender norms and roles mean that men are often the primary decision makers when it comes to energy expenditure (Energia, 2021). Therefore, women are likely to have less control over the types of market mechanisms they engage with. However, levels of decision making between men and women vary between castes. In addition, out-migration of men to India or the plains within Nepal has made many women heads of families in the Hill Region

where women's ownership of bank accounts is also higher (ibid). Therefore, in such contexts women are more likely to be the primary decision makers around market mechanisms.

Many of the factors which result in low coverage of social protection may also hamper the reach of market mechanisms to women. 55% of the Nepalese workforce are women and only 26% of female workers are formally employed, many in agriculture (Energia, 2021). Those working in the informal economy or engaged in seasonal or casual employment are more likely to be excluded from social protection (UN, 2018). Identifying and registering beneficiaries, monitoring payments and controlling for potential errors also requires significant administrative capacity (UNDESA, 2021). However, this is likely to be challenging for the Nepalese government as it has limited capacity to deliver services to the remotest communities (Energia, 2021). Registering and accessing support payments can also have significant costs in terms of travel and lost income (UNDESA, 2021).

9. Key findings and conclusions

- **People living in extreme poverty in Nepal have significantly lower levels of energy access than the rest of the population.** We estimate that ~29%, 0.28 million people living in extreme poverty remain without electricity access and 95%, 0.9 million, have no access to clean cooking energy. **Financial support will be needed by people living in extreme poverty in Nepal if they are not to be left behind.**
- **There is some evidence that female headed households may have even lower levels of energy access than male headed households living in extreme poverty in Nepal.** However, differences between male and female headed households may obscure **more fundamental differences in the capacity for women and men to meet their energy needs in the context of unequal power dynamics within households.**
- **Cost is the main reported obstacle to adoption of solar home systems and clean cookstoves by people living in extreme poverty in Nepal, and the main obstacle after distance to grid connection.** Market mechanisms which address affordability thus have the potential to enable a significant proportion of those living in extreme poverty to achieve access.
- **More than three quarters of people living in extreme poverty said they would be willing to pay upfront for a grid connection, but only 19% for a SHS and 36% for an improved cookstove.**
- **The option to pay in instalments increases willingness to pay for energy access among people living in extreme poverty in Nepal,** bringing it broadly in line with the rest of the population. **Market mechanisms which spread costs over time could enable many to access energy.**
- **Combining payment by instalments with a cost subsidy further increased willingness to pay.** Virtually all of those living in extreme poverty were willing to pay for a grid connection, but **~40% of people living in extreme poverty remained unwilling to pay for a SHS and 53% were not willing to pay for an improved cookstove,** even on these terms.

- **The main barrier to grid connection (apart from cost and distance) was the complexity of the application process.** In addition, some people living in extreme poverty had been refused a connection or were unable to connect because they did not have their landlord's agreement to do so. Removal of these barriers could enable more people living in extreme poverty to gain grid access.
- **Almost a third of people living in extreme poverty who were unwilling to pay for a solar home system gave unavailability of maintenance services as the reason** and unreliable fuel supplies deterred some from purchasing an improved cookstove.
- **Over a third of people living in extreme poverty who were unwilling to pay for an improved cookstove, said they did not need one** and 6% said that they didn't have enough information. (It may be that in a country where improved cookstoves were, at the time of the survey, less common than LPG stoves, the stoves offered were not regarded as desirable.)
- **Those living in extreme poverty, especially those in rural or remote mountainous areas, in Nepal are more affected by factors likely to limit market mechanism reach** than the wider population. Therefore, more targeted support to improve awareness and understanding around market mechanisms is needed.
- **Women are more acutely impacted by factors likely to hamper the reach of market mechanisms and face additional challenges.** These include time poverty and gender norms around male and female interactions; limited decision-making power within households; and lower levels of formal employment and documentation. Awareness of gender dynamics and informality will be needed to improve targeting of mechanisms to women.

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11. Endnotes

¹ The other reviews in this series are of Ethiopia, Kenya, Nigeria, Rwanda and Zambia

² Defined by the World Bank as those living on less than US\$2.15 per day at 2017 purchasing power parity (PPP) <https://www.worldbank.org/en/news/factsheet/2022/05/02/fact-sheet-an-adjustment-to-global-poverty-lines>

³ We re-analysed the data from this survey to compare the responses given by people living in extreme poverty with responses from others, living above the extreme poverty line. It should be noted that, because extreme poverty rates in Nepal are relatively low, the number of extreme poor households in the sample (~250 = ~4%) is also small, and conclusions drawn for this group may therefore be less reliable.

⁴ We estimate, from figures in the Nepal Beyond Connections: Energy Access Diagnostic Report that 0% of grid connections and 4.4% of off-grid solutions in Nepal did not achieve tier 1 electricity access.

⁵ Only a small number (~50) of female headed households living in extreme poverty were included in the survey sample, so these conclusions must be treated with considerable caution.

⁶ It is recognized that responses given regarding willingness-to-pay cannot be taken entirely at face value, and so percentages of people saying they would be willing to pay at a particular price point may not be entirely realistic. However broad inferences may be drawn from the overall pattern of responses.

⁷ The World Bank surveyed approximately 1,000 people in each of more than 160 countries included in the Findex Database, using a randomly selected, nationally representative sampling method.

⁸ S&P's Global Financial Literacy Survey measured the concept in terms of understanding of four key elements of financial decision making: risk diversification, inflation, numeracy and compound interest. A person was considered financially literate if they could answer 3 out of 4 questions related to these topics correctly.