

Smoke-free Nepal

Challenges and opportunities



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Traditional cooking fires are still used in more than half the households in Nepal. But they are a silent killer, with their smoky fumes responsible for the deaths of nearly 23,000 people every year. The Government of Nepal was one of the first to recognize this problem and has a target to eradicate smoke from kitchens by 2017. As we approach this date, it is clear the target will not be met. The global shock, compassion and outreach in response to the devastating Gorkha earthquake of April 2015, which killed nearly 9,000 people, has inevitably diverted resources and attention. In this briefing we reflect on the main barriers to reaching the smoke-free target, including its gender dimensions, and recommend actions to accelerate progress.



Household Air Pollution from smoky cooking fires causes over 22,800 deaths per year in Nepal

The Government's goal of 'smoke free' Nepal by 2017 will not be met

Executive summary

Smoke from traditional cooking fires is one of the biggest causes of death and disease in developing countries. In Nepal the annual number of deaths is estimated by the World Health Organization to be over 22,800. The huge Gorkha earthquake of April 2015 had a devastating impact, affecting the lives of 5.6 million people across the 14 affected districts. And yet its death toll was around 9,000: less than half those killed by household smoke, which is often accepted as a fact of life.

The Government of Nepal has been one of the most progressive globally on the issue of household air pollution. It introduced policies to encourage clean cooking more than 35 years ago and has an active energy subsidy programme, which includes subsidies for the purchase of approved cookstoves. In 2013 the government set the ambitious target of making all kitchens 'smoke free' by 2017. At the time it recognized this would require a step-change in the number of improved cookstoves installed, but felt this target could be achieved. The earthquake and five-month blockade of the country's links with India caused major shocks to the national economy and diverted a great deal of effort and resources. As we approach the end of 2016, it is clear the target of clean cookstoves for all will not be met.

In this briefing paper we explore the scale of the challenge, including the improvements that will have to be made if national and global guidelines for indoor air quality are to be met. We outline the reasons why people may be slow to adopt clean cooking solutions, linked to: levels of demand and awareness, affordability, availability, the design of products, and the policy environment. For each issue, we explore the gender dimensions that are part of the structural barriers, but also offer opportunities for faster progress.

In conclusion we suggest key steps that will need to be taken to accelerate progress if the government's target is to be met by its new deadline of 2022. These include the rapid implementation of better measurement of clean cooking (using the World Bank's multi-tier framework), a more systemic and participatory approach to markets for clean cookstoves, a continuing strong emphasis on gender considerations, and a focus on energy access as part of post-earthquake reconstruction efforts. Increased media attention and national awareness campaigns will also help to raise the profile of the issue.

This briefing paper emphasizes the scale of the challenge facing the global community if we are to achieve the targets of universal access to energy set as part of Sustainable Development Goal 7.

Cooking over
a traditional
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Introduction

Daily exposure to toxic smoke from traditional cooking practices is one of the world's biggest killers. It causes a range of deadly chronic and acute health conditions, such as child pneumonia, lung cancer, chronic obstructive pulmonary disease, heart disease and a range of eye conditions including cataracts. Typical wood-fired cookstoves and open fires emit small particles, carbon monoxide and other noxious fumes in concentrations up to 100 times higher than the limits set by the World Health Organization (WHO, 2016a) and, in some settings, considerably higher (GACC, 2016). The effects have been equated to breathing in the secondary smoke from 400 cigarettes an hour.

According to the most recent estimates, 4.3 million deaths a year globally can be attributed to household air pollution (HAP) (WHO, 2014). This makes cooking with solid fuels the largest environmental contributor to ill health. In low and middle-income countries, HAP is responsible for almost 10 per cent of mortality.

The issue is recognized prominently in the Sustainable Development Goals through tracking the 'percentage of population with primary reliance on clean fuels and technology' (target 7.1) and the 'mortality rate attributed to household and ambient air pollution' (target 3.9). It is encouraging that household and ambient air pollution will be monitored separately (GACC and Energia, 2016).

Yet, significant financing gaps remain. In 2013 US\$0.4 billion was invested globally in clean cooking, which is only 10 per cent of the \$3.8 billion required (IEA, 2015; World Bank, 2015). It is not surprising, therefore, that the International Energy Agency predicts that by 2030, 2.6 billion people will still be without access to clean cooking fuels (IEA, 2012). In addition, the burden of finding firewood is growing, with the time taken to reach sources of wood increasing and prices for buying wood on the rise (AEPC, 2013).



The burden of collecting firewood is increasing as sources become more scarce.

Credit: Practical Action Nepal

The earthquake that hit Nepal on 25 April 2015, and the major aftershock on 12 May, killed nearly 9,000 people and injured nearly 22,000. It affected the lives of 5.6 million

people in the 14 most affected districts and left more than 1.4 million people needing food assistance. More than 600,000 houses were destroyed and another 290,000 were damaged (UNFPA, 2016). The impact was severe and dramatic, and rightly attracted global attention. The deaths, disease and economic burden caused by smoky kitchens, however, far exceed the impact of the earthquake. Two and a half times more people (22,841 in 2012, according to WHO, 2016b) die every year in Nepal from the effects of smoky kitchen fires in an unfolding, silent tragedy. Despite this, the issue receives only minimal attention from global and national institutions and the media.

The Government of Nepal has been one of the most progressive of all developing countries in terms of its awareness of, and policies geared to addressing, the problems caused by smoke from cooking fires. In January 2013 the Clean Cooking Solutions for All by 2017 (CCS4All 2017) initiative was launched, setting a target for Nepal to be 'smoke free' by 2017. Sadly, as we approach the end of 2016, it is clear this target will not be met. In this briefing we explore the major barriers to achieving this target, looking in particular at gender dimensions. We hear insights from local policymakers and call for greater action to stop the killer in the kitchen.

Background to clean cooking in Nepal

The Government of Nepal has included clean cooking in its 5-yr plans since 1980

Efforts to introduce clean cooking in Nepal date back many years. The first improved cookstove, imported from India, was demonstrated at a technology exhibition in 1956. It was not until the 1970s that a more widespread programme was started, promoting a large mud-built stove with multiple rings called the Lorena, later adapted, improved and renamed the Nepali chulo. During the 1980s this and other improved wood-burning stoves were promoted and distributed by government departments and agencies such as the United Nations Development Programme and the Food and Agriculture Organization. Clean cooking solutions were included for the first time in the country's sixth five-year plan in 1980.

Over time the number of models and types of stoves available in Nepal increased, though mostly distributed for free or at very low prices and without efforts being made to develop local value chains. As a result, the programmes were unable to be sustained without continued external support.

In the country's ninth five-year plan (1997–2002), energy saving and energy efficiency were emphasized and a national improved cookstoves programme was launched. It was implemented by the Alternative Energy Promotion Centre (AEPCC), established in 1996 as the government hub for all decentralized, renewable energy programmes.

In 1999 the Energy Sector Assistance Programme (ESAP) placed greater emphasis on developing local capacities for design, manufacture and marketing. ESAP phase 1 (1999–2006) initially focused solely on mud-brick stoves for the mid-hill districts. Over time the types of stove included have expanded, as has ESAP's geographical reach.

Current programme for promoting clean cooking: NRREP 2012–17

The promotion of improved cookstoves is part of the National Rural and Renewable Energy Programme (NRREP) 2012–17. NRREP is designed to bring all energy access programmes under one umbrella: cookstoves together with rural off-grid electrification. The programme has three components: financing via subsidies and access to credit,

The intention of NRREP is to stimulate a vibrant market system for cookstoves

technical support, and business development for productive uses of energy. Questions of gender equality, social inclusion, and climate are mainstreamed throughout.

Under NRREP the role for government is providing technical support and capacity building, managing the subsidy programme, setting standards, and regulating the market. The intention is to stimulate a more vibrant market system for cookstoves. Civil society organizations are envisaged as playing a role in awareness raising, changing behaviours, reaching the poorest and most disadvantaged, and advocating for the needs of the poor.

The programme is supported by the Renewable Energy Subsidy Policy 2016 and a Biomass Energy Strategy (yet to be approved). The subsidy policy gives the greatest support to mountainous areas, with less to hill districts, and the least support to districts in the Terai. This is in recognition of the greater levels of poverty and remoteness from markets (with increased transport costs) in the high mountains. There is additional support for districts affected by the earthquake.

Geographic distribution of cookstoves

About 52 per cent of the population (2.95 million households) are using traditional cookstoves. Table 1 shows the cumulative number of improved cookstoves; however, the number *in use* could be lower. Most of the installed mud and metallic improved cookstoves fall under the Tier 1 rating of the World Bank multi-tier framework (ESMAP, 2015).

Table 1 Cooking solutions in Nepal, 2015

<i>Types of cookstove</i>	<i>No. of households</i>	<i>% of all households</i>
Traditional	2,952,052	51.6
Improved – mud	913,985	16.0
Improved – metallic ¹	23,130	0.4
BLEN ²	1,837,198	32.1
<i>Total</i>	<i>5,726,365</i>	<i>100</i>

Note: These figures differ from those in the SEforAll Country Action Agenda (NPC, 2016). They include additional numbers, in particular from BLEN solutions, but fewer with mud improved cookstoves.

1 Most mud and metallic improved cookstoves fall under Tier 1 of the World Bank's Multi-Tier Framework, with locally-defined improvements in efficiency and therefore important fuel savings, but with improvements in indoor air quality which do not make a significant difference to health.

2 Breakdown of BLEN stoves in use: LPG 1,455,806; biogas 315,000; kerosene 61,398; electricity 4,994.

Source: adapted from AEPC, 2013, 2016a; Central Bureau of Statistics, 2011b

The use of improved cookstoves (ICS) is not evenly spread across Nepal's three geographic zones. Each has its own particular challenges with different patterns of cooking and resource availability. Open fires remain the most prevalent type of stove in the mountainous areas and the least common in the Terai plain. Liquefied petroleum gas (LPG) is used more widely in urban areas, reflected in the figures for the hill districts (see Figure 1).

In the Terai, firewood is becoming increasingly scarce and people commonly resort to dried cow dung as a fuel. Many ICS models are not designed to burn this fuel, while the government would prefer dung to be used to improve soil structure and fertility. Biogas is being promoted as a good alternative, but uptake remains slow due to the very high initial costs and some sociocultural issues.

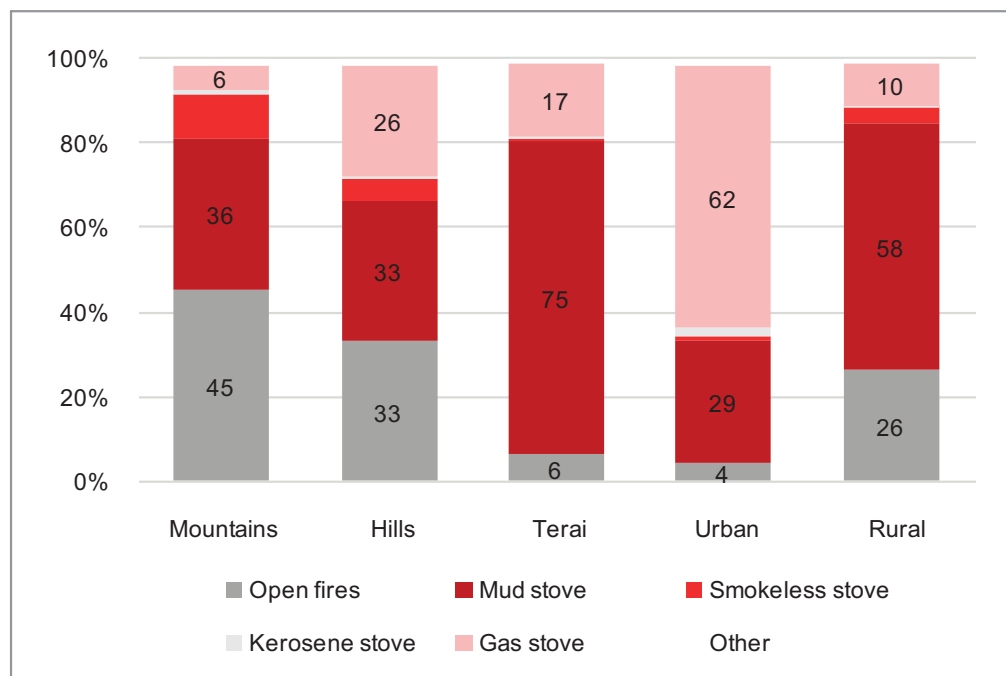


Figure 1 Types of stove by region, 2011

Source: CBS, 2011b

The majority of ICS programmes and stove designs have historically favoured the hill districts, though this bias is not found in current programmes. Wood fuel is more widely available here than on the Terai. In the high-hills and mountainous areas, temperatures can be very low and fires are used not only for cooking but also for heating. The smoke is also important for drying and curing meat, and protecting roofing timbers from pests. Fires serve a variety of purposes and designs need to accommodate this.

Targets for clean cooking and indoor air quality, and pace of delivery

The Nepal targets for indoor air quality are ambitious and in line with global health advice

In 2009 the Government of Nepal endorsed National Indoor Air Quality guidelines, drawing on WHO guidelines (Government of Nepal, 2009; WHO, 2006). These set limits for the maximum concentrations of particulate matter (PM), carbon monoxide and carbon dioxide. The target for PM_{2.5} (24-hour average), for example, is set at 60µg/m³. This lies between WHO's ideal (25µg/m³) and interim targets (75µg/m³) (see Figure 2). They are now backed up by technical guidelines for stove performance (AEPC 2016b). The interim target is a level at which significant health benefits begin to accrue. In other words, the Nepal targets for indoor air quality are ambitious and in line with global health advice. They represent a significant reduction from levels of emissions commonly measured for traditional cooking fires (Joon et al., 2011).

In January 2013 the Government of Nepal announced its target for Smoke Free Nepal by 2017. The country's SEforAll Action Agenda clarifies that this means access to Tier 1 cooking solutions for all by 2017 (NPC, 2016). Tier 1 of the World Bank multi-tier framework for access to cooking solutions represents a small step up from traditional cooking fires. It has only two attributes: indoor air quality and cookstove efficiency, the levels of which are to be 'specified by a competent agency consistent with local cooking conditions'. The Nepali guideline level for indoor air quality would only be reached with a Tier 4 solution, with universal access targeted for 2030 in Nepal. In other words, although achieving the goal of the CCS4All initiative would represent a significant achievement, it would not actually achieve smoke-free kitchens. The

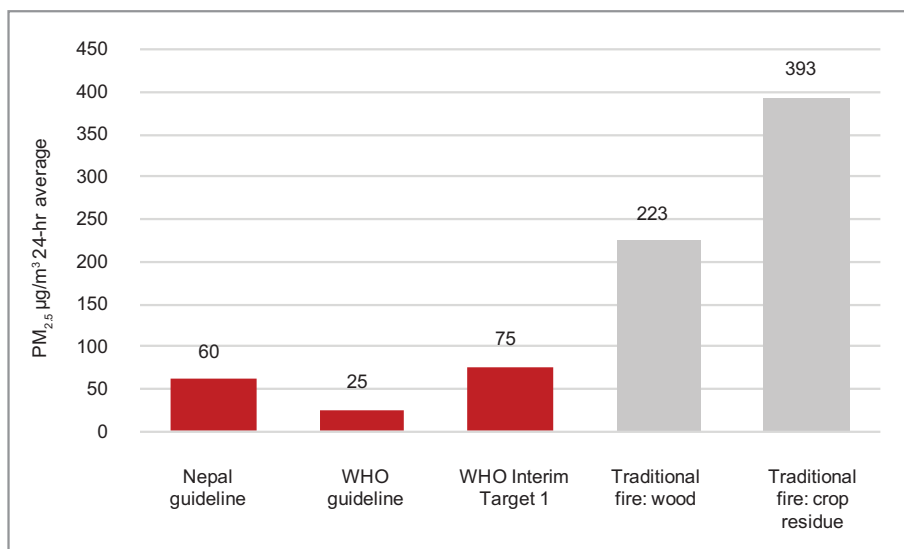


Figure 2 Target levels of emissions compared with emissions from traditional fires

Source: Government of Nepal, 2009; WHO, 2006; Joon et al., 2011

executive director of AEPC recognizes this and has emphasized the importance of ‘gradual graduation of households from the clean to the cleanest’ (interview with Practical Action, September 2016).



Women using traditional cookstoves are exposed to very high levels of damaging smoke, Dhading, Nepal
Credit: Prabin Gurung, Practical Action Nepal

The smoke-free goal required 550,000 stoves per year for five years

This serves to further underline the scale of the challenge if the health dangers from smoky cooking fires are to be eliminated. At the time of launching the CCS4All initiative, there were about 650,000 improved biomass stoves and 131,000 biogas plants installed against a total of 3.4 million that would be required. To achieve the universal access target would have required a significant step-change. During the mid-2000s, 40,000–50,000 stoves and 16,500 biogas plants were being installed per year. This had doubled to just over 100,000 per year in 2011 and 31,000 biogas plants in 2013. However, to meet the smoke-free goal would have required 550,000 installations per year for the five years between January 2013 and December 2017 (see Figure 3).

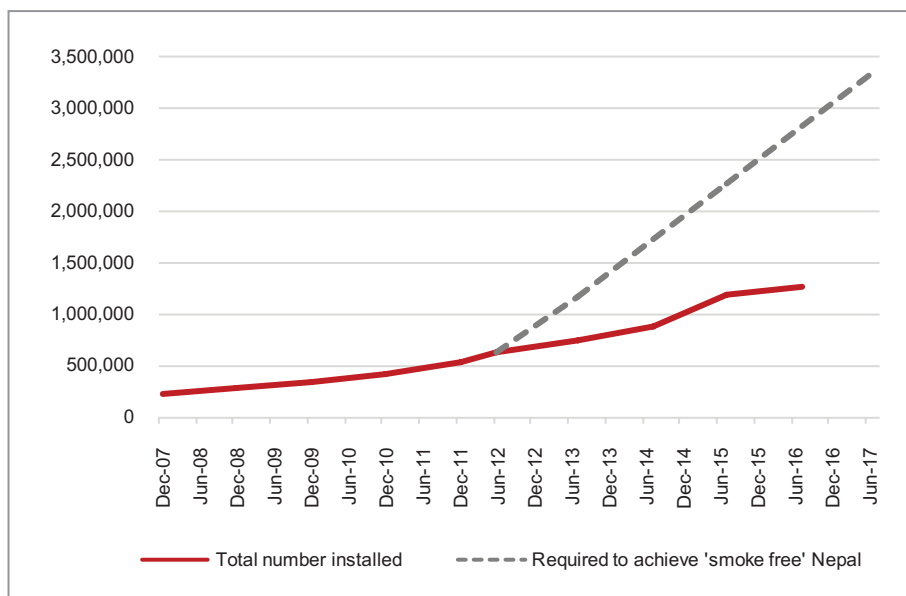


Figure 3 Cumulative number of improved cookstoves installed, compared to required level to achieve clean cooking for all
 Source: AEPC, 2016a

The goals expressed under the NRREP, before CCS4All was launched, were conservative, but based on the funds available and implementation capacity. They aimed for 475,000 stoves, plus 130,000 household biogas systems in total over five years (2012–17). They were in line with the existing pace of change, but would not even be fast enough to achieve 100 per cent access by 2030.

As part of the SEforAll Action Agenda, a ‘business as usual’ scenario has been mapped out which assumes the current levels of progress will be maintained but not accelerated. It predicts that by 2030 there will still be 560,000 households using traditional stoves, despite significant numbers gaining access to mud improved stoves and LPG (see Figure 4).

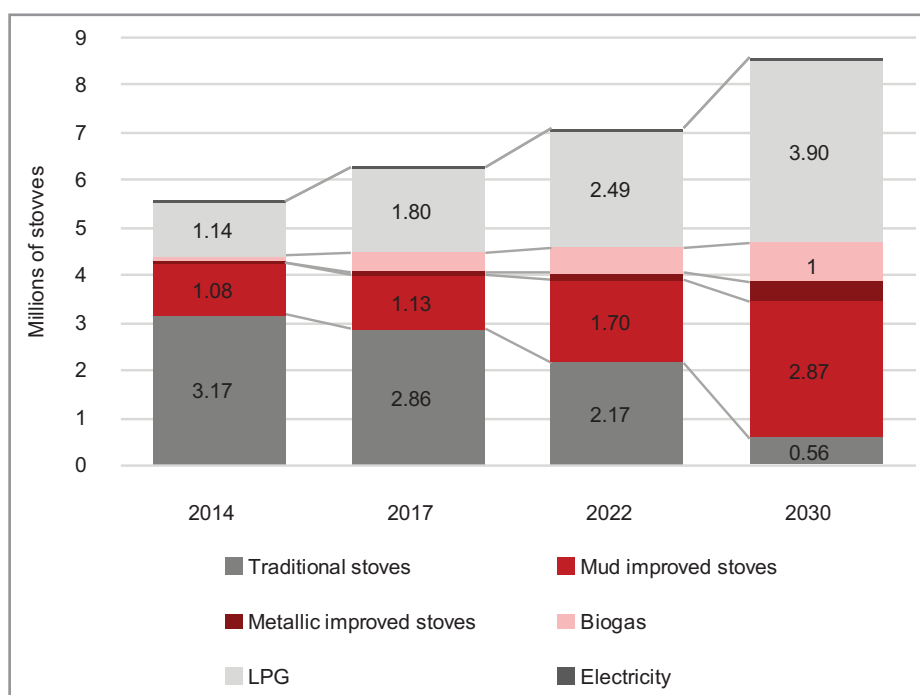


Figure 4 ‘Business as usual’ projections for access to cookstoves
 Source: NPC, 2016

The number of improved cookstove installations has been rising since 2008 (see Figure 5). A significant change appeared in the year 2014–15, with the AEPC showing a record 310,281 cookstoves installed. But numbers fell back again in 2015–16 to just 73,161 plus 14,247 biogas plants. This can in part be directly attributed to the impact of the earthquake. But beyond that, there were changes in leadership at AEPC and the gradual withdrawal of donor support, with attention and funds being diverted to earthquake relief efforts.

It is clear, therefore, that the 2017 target will not be met. The AEPC now aims to meet the target of Tier 1 clean cooking for all by 2022.

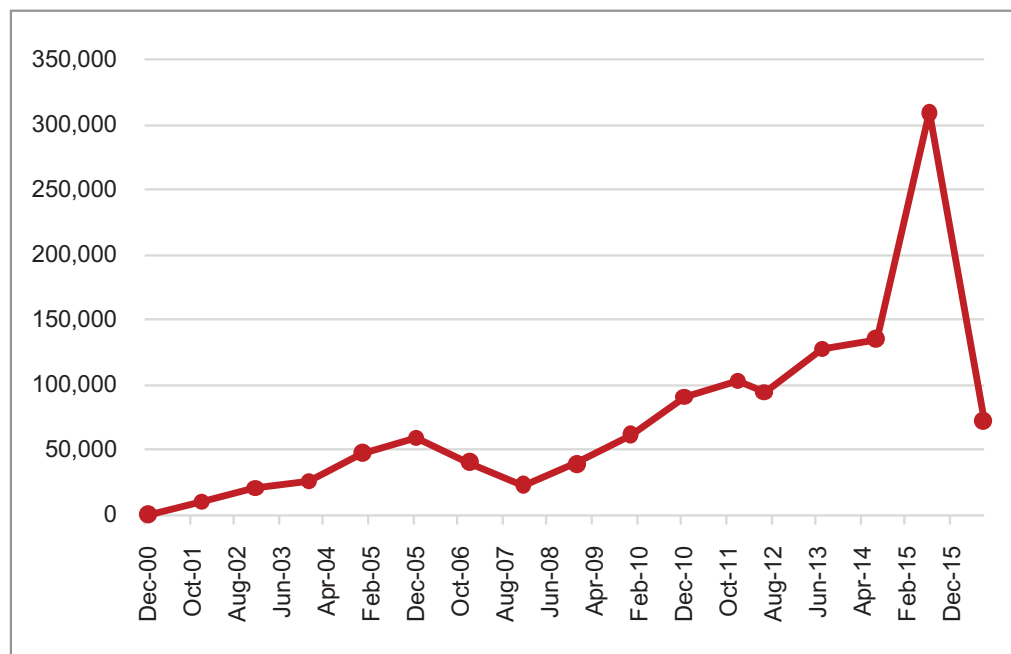


Figure 5 Installations of improved cookstoves per year, 2000–2015

Source: AEPC, 2016a

Why clean cookstoves are not adopted more widely

What are the reasons for the only gradual pace of adoption of improved cookstoves, despite the sustained level of policy interest, government programmes, and donor support? The draft SEforAll Nepal Country Action Agenda highlights a number of barriers. These were elaborated on in our discussions with AEPC’s executive director. In addition, there is a range of embedded gender issues that inform barriers but also opportunities for future progress (Practical Action Consulting, 2014).

Lack of demand: awareness and prioritization of household expenditures

One very significant factor is a lack of awareness of the benefits of clean cooking. Even when people are aware of the dangers of smoky stoves, other factors mean they do not prioritize expenditure on this:

- Their current cooking solution is essentially free in cash terms, as fuel is collected for free and women’s time spent collecting it is not valued highly.
- Men generally control the family finances and need to agree purchases of this sort. Clean cooking and fuels are not among their top priorities, though they are for women.

Men control family finances but clean cooking is rarely a top priority for them

Involving women in customer-facing roles in ICS market chains increases cookstove adoption

- Clean cookstoves do not bring direct and immediate financial benefits, but they do have significant indirect benefits in terms of health, time saved, comfort, and environmental improvements.
- People have limited confidence in the products because of the poor performance of some models.

There is also a lack of awareness of potential financial support. An AEPC (2013) study found that a quarter of those who had bought metallic improved stoves in the high-hills areas were not aware that they could have received a government subsidy.

A greater involvement of women in the customer-facing operations of ICS market chains, including awareness creation, market development, sales, and servicing, seems to lead to increased cookstove adoption. Women know better the preferences and needs of users, can better design appropriate stoves, and can better communicate their benefits to customers. They can also generate awareness and create demand among a wide range of consumers by leveraging their networks.

Affordability

A considerable proportion of the population cannot afford even the cheapest mud improved cookstove costing around \$5. Metallic stoves (required at high altitudes) and higher tier stoves are more expensive again. At the same time, the limited scale of manufacturing locally means that economies of scale are not being achieved and prices are relatively high.

Government subsidies help to reduce the price consumers pay for an improved stove. The Renewable Energy Subsidy Policy set the levels of subsidy at up to 50 per cent for metallic stoves or mud stoves with a partial metallic component (rocket stoves and gasifier stoves). The maximum amount of subsidy is 3,000–4,000 rupees (US\$28–37), with an additional 1,000 rupees for single women, disaster victims, extreme-poor households, among others. The programme is limited to a few specified stove models. The amounts of subsidy available for biogas are higher (up to 35,000 rupees (\$322) for the largest systems in the prioritized mountainous districts), but the initial outlay remains high. Subsidies do not extend to the installation of smoke hoods, which can also be an important part of the solution to improving indoor air quality.

Even with a subsidy, the upfront costs of improved cookstoves can be a barrier. More programmes have begun to allow payment by instalments, but there is still

Case study: Khima Bisowkarma, biogas user, Tikapur District

Tikapur is a district in the Terai region. Khima, aged 22, is responsible for preparing food for a family of 12. Finding firewood was increasingly difficult and it was expensive to buy. She also used traditional dung cakes for fuel. She said, 'the firewood was expensive and would not burn properly. It gave a lot of smoke and consumed a lot of time. My eyes used to water continuously and I had problems breathing.' Through a Practical Action project, the family became aware of the possibility of installing a biogas plant and linking it to a toilet. The family took a loan from the bank and were supported by the National Biogas Company to build their own system. Now Khima says 'cooking has become much easier and time saving. And now we do not have to go across the river for defecation... I was initially reluctant to use the residue on my fields, but once I tried, it has really increased the productivity of our land.'

Source: Practical Action, 2012

no engagement by microcredit institutions in the sector (either for consumers or producers).

Further, some people are aware of the free distribution of stoves, which has been increased as part of earthquake relief. This can make people reluctant to pay for a stove, preferring to wait in case they might receive one for free.

Supply barriers: availability

There are few ICS manufacturing workshops in the country with low production capacity

Even if people would like to invest in an improved cooking solution, products may not be easily available. For many years, programmes were largely donor driven and thus limited to the geographic areas touched by those programmes. While many of these have worked to develop the technical skills of, for example, master stovemakers, there has not been sufficient thought to how to ensure the spread of expertise. This may be beginning to change, but will take time to develop. There is still only a small number of ICS manufacturing workshops with a low capacity in the country. The existing gap between supply and demand has created problems in establishing a sustainable market of clean cookstoves with manufacturers not being in a position to take risks to expand their operations.

Engaging women in ICS market chains can steer the design of more appropriate products, help generate demand, and increase adoption and use. However, sociocultural and economic constraints have kept women's level of involvement in ICS market chains very low. Women are more likely to be involved in on-site manufacture of stoves (mainly mud ICSs). This has often been supported by civil society organizations prioritizing gender equity and also attracts women because the work fits with skills they already have, such as pottery. Women's involvement in the market chains of factory-produced and imported cookstoves is generally very low.

Involvement in cookstove market chains can bring strong benefits to the women themselves. They gain great satisfaction from earning their own incomes. They often invest in better education for their children or in household assets that lead to a more secure future for their families. They become role models for their peers and can motivate other women to follow their example, leading to further involvement of women in these markets (Practical Action Consulting, 2014).

Case study: Dilmaya Ghale, smoke hood and improved stove user, Dhading District

Dilmaya is the matriarch of a large family in Dhading District and, although elderly, still plays the major role in looking after the house, cooking, and brewing alcohol. She would blow the fire continually to keep it alive, her eyes watered constantly, and her eyesight was failing. Her daughter said, 'I wondered all the time how I could remove the smoke from the kitchen. I was scared for my eyes. Earlier I had to clean the stored things and utensils all the time, as the smoke would blacken everything. I had to repaint the inner walls with mud every month.' After installing a smoke hood and improved stove, the situation is much better. Firewood use has reduced by 25 per cent and levels of PM_{2.5} and CO have reduced by 60 per cent. This makes a noticeable difference to Dilmaya's symptoms and significantly reduced the burden of finding and processing fuel, cooking, and other household chores.

Design of products

One reason for some households not investing in improved cookstoves is that they do not think the design of the stove will meet their needs. The SEforAll Action Agenda suggests that many stoves perform poorly and do not address the needs of cooks – pointing to



Saraswoti Bal, a villager from Dhading District using an improved cookstove and smokehood which can reduce exposure to household air pollution by as much as 82%

Credit: Prabin Gurung, Practical Action Nepal

the need for greater input from users into designs. Indeed, once someone has acquired a stove, if it fails to meet their needs it may be abandoned: ‘The despatch and initial acceptance of a stove is not a sufficient condition to ensure the delivery of its benefits’ (Ruiz Mercado et al., 2011).

84 per cent preferred new stoves over traditional fires, but some design problems remains

What, therefore, has been the experience of stove users? Two recent studies found encouraging results. AEPC’s 2013 study found that only 8 per cent of improved biomass stoves had been abandoned and that 65 per cent of users had totally dismantled their traditional stove. These findings should be treated with caution, however, as they relied on reported use, rather than more accurate direct observations or remote monitoring. A WASHPlus 2015 study used remote monitoring devices alongside survey responses. In a test of five improved cookstoves, after 16 weeks, 84 per cent preferred the new stove over their traditional stove. Users said the benefits included using less firewood, reduced smoke, and quicker cooking times. More than half (52 per cent) observed less smoke, fewer ashes, and a cleaner house. They even concluded that Nepali main course items cooked *better* on the new stove.

Yet, there were disadvantages and some of these led to the continued use of traditional stoves for at least some purposes. The major disadvantages were related to the stoves’ fuel requirements. Wood had to be chopped into smaller pieces and wet or undried wood could not be used. Though the stove cooked food more quickly, the fire also went out more quickly so needed to be tended more regularly (requiring more time in the kitchen).

An issue that emerged strongly was that the new stoves were used less in the more mountainous areas during the winter because they did not help to heat the house. Women enjoyed the warmth of a traditional fire in the early morning in the winter and would then continue to use the same fire for cooking throughout the day. Despite this, many continued to value their new stoves and went back to using them during spring and summer.

There still appears to be a need for better products to meet needs year-round. There may also be a need for better customer information about fuel requirements, and work to be done on fuel availability and the time spent chopping wood fuel. Mandatory ICS performance testing, quality control, and a ratings system which is clear for the general public would also help. Stronger after-sales services, such as warranties, maintenance, and adequate orientation and advice for users, are also very important to increase household confidence in ICS usage and ensure they get the maximum benefit from it.

Planning, policy, and institutional barriers

Despite the positive approach and priority that is placed on clean cooking in Nepal, some barriers remain in the enabling environment. One significant point is a financing gap at the national scale. The SEforAll Action Agenda concludes that the estimated cost of providing all households with clean cooking by 2017 (at Tier 1 level) would be \$593 million, which represents 9.5 per cent of the total government budget for 2013/14.

There is also a degree of bureaucratic inertia, as it takes time for new products to be approved as eligible for subsidies. Even then, the delivery mechanism for the subsidy is not clear to all. This may have been partly due to a focus on numbers distributed rather than on research and development to improve the appropriateness of available stoves, and to understand new developments in products or business models.

Finally, despite the data collected regularly by AEPC, there is a mismatch with census records. This is probably related to a number of stoves being abandoned or breaking over time, which is not accounted for in the AEPC numbers. This hinders an accurate estimate of the true scale of the problem.

Policymaker perspectives on barriers

The executive director of AEPC, Mr. Ram Prasad Dhital, is aware of these barriers. In an interview in September 2016, he reflected on the key issues that are preventing faster adoption of clean cooking solutions. He recognized that the earthquake and border blockade by the Indian government for five months (September 2015 to February 2016) caused serious disruption. But beyond that, he pointed to some embedded problems that AEPC is trying to address, highlighting:

- Weak market development, with the whole supply chain needing enhancement. This can partly be linked to the over-enthusiasm (to a degree) of the government, which has perpetuated an NGO-led model. This has hindered the development of a self-propelling stove market in which businesses take the lead in marketing their products. There are too few local stove-manufacturing businesses and training has focused on technical aspects rather than business development.
- Too much focus on the supply side and not enough on generating demand and on working with local governments and district officials.

Nevertheless, he felt that the new subsidy policy and other initiatives in place, such as results-based financing, would help to address these problems. The government remains committed to achieving these targets, to bring health, environmental, and economic benefits to some of the poorest rural households.

The earthquake and border blockade caused serious disruption, but AEPC recognizes embedded problems need addressing

Conclusions and policy recommendations

This review of efforts towards clean cooking in Nepal serves to illustrate the size of the challenge facing the global community in achieving the SDG Goal 7 on energy access (including clean cooking) for all by 2030. The Government of Nepal is strongly committed to addressing this challenge and has been increasing its level of ambition in this area for a number of years. And yet, solutions will not be achieved quickly. There is a range of embedded challenges that need to be addressed in terms of demand, supply chains, and some aspects of the policy environment.

Each set of barriers identified in the SEforAll Action Agenda has a clear gender dimension, which underlies some of the barriers but also offers new opportunities for accelerating action and empowering women.

One approach to tackling all these problems would be to analyse the market system for particular types of cookstove (EUEI PDF, 2015). If done in a participatory way involving all relevant actors in the value chain, a better shared understanding of the major barriers could be achieved. This would help identify key entry points and areas where greater support or government intervention is needed.

We recognize the significant steps the Nepali government and various development partners are taking to accelerate the pace of change to achieve clean cooking. The Nepal Alliance for Clean Cookstoves has also played an important role in keeping the issue high on the agenda and co-ordinating efforts. The following actions would also help:

- Rapidly adopt and implement the multi-tier framework for measuring progress on clean cooking to ensure the scale of the problem is properly understood and to keep track of progress against the government's own targets for adoption and indoor air quality. The amounts of subsidies could also be based on stove performance.
- Work with all the relevant market-chain actors to jointly analyse the market systems for particular types of stove or fuels in different parts of the country so that interventions can be targeted to address the remaining issues.
- Ensure that gender considerations are at the forefront of all planning and programming activities because this will help to accelerate progress and strengthen women's empowerment.
- Ensure that clean cooking is properly considered in moving from relief to development post-earthquake, and that efforts are geared towards strengthening, rather than undermining, long-lasting solutions.
- Increase media attention to ensure greater coverage of this issue both in Nepal and globally as part of an ongoing programme to raise awareness and encourage a greater focus on the devastating impacts of traditional cooking practices.

While these systemic issues are slowly addressed, thousands of people will continue to die from the effects of traditional cooking practices. These numbers are huge and shocking when put in the context of the devastating loss of life from the earthquake. And yet they happen silently and gradually in smoke-filled kitchens where traditional practices are still accepted as 'the way it has always been'. The scale of progress needed will only be achieved by encouraging strong partnerships between all actors - government, private sector and civil society. With the right support, Nepal's pioneering efforts could shine as an example within the region and around the world of how to develop a healthy energy access ecosystem.

Increased media coverage would raise awareness of the devastating impacts of traditional cooking practices

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Front page photo: Mother and child with an improved mud stove and smoke hood in Dhading District, Nepal. Credit: Jamie Oliver, Practical Action

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