ENERGIZING FINANCE
RESEARCH SERIES

SUSTAINABLE ENERGY FOR ALL

CLIMATE POLICY INITIATIVE

ENERGIZING FINANCE: UNDERSTANDING THE LANDSCAPE 2020

CHAPTER

5

CLEAN COOKING IN BANGLADESH

Photo by: Clean Cooking Alliance

COUNTRY CONTEXT

In Bangladesh, the eighth most populous country in the world, more than 60 percent of the population currently lives in rural areas and is mainly dependent on agriculture as a primary source of income (World Bank[44]). As of 2018, almost 80 percent of households (of a total 35 million households) lacked access to clean cooking alternatives. This includes both rural and urban areas (CCA[45]).

According to the World Health Organization (WHO), over 70,000 people in Bangladesh die annually from diseases related to Indoor Air Pollution (IAP). Moreover, excessive reliance on fuelwood and burning of biomass continue to contribute to deforestation and other climate challenges in Bangladesh. Between 2011 and 2019, the country lost 9 percent of its tree cover (global average of 9.2 percent) equivalent to more than 65Mt of CO2 emissions (Global Forest Watch 2020). Despite multiple environmental, health and economic effects, rural households are reluctant to switch to cleaner cooking technologies due to social, economic and cultural factors such as lack of awareness, affordability, and preferences to a certain taste and texture of the meals, among others.

Albeit at a decreasing rate, Bangladesh's population is expected to grow to approximately 245 million by 2050, creating additional pressure on already scarce resources (UNDP). However, this also brings several opportunities. A younger demographic coupled with increasing urbanization, rising health and technological awareness, and rising standards of living indicate a potential concomitant transition to cleaner cooking preferences. Over 95 percent of the population and more than 80 percent of the rural populace in the country has electricity access which can be leveraged to establish a supply chain for efficient electricity-based cooking solutions in the most remote areas (see Box 6).

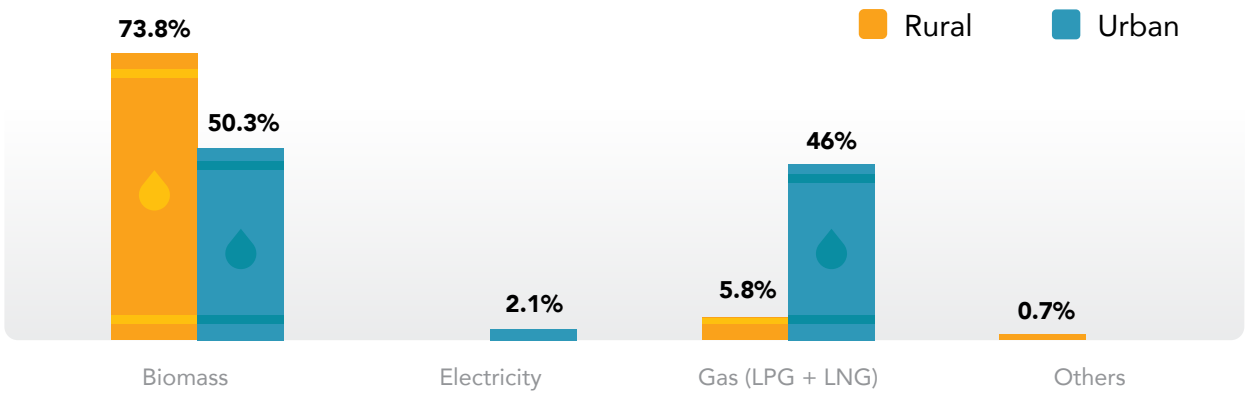
Despite more than 55 percent of the population using traditional cookstoves,[46] the current landscape of Bangladesh offers a conducive market for clean cooking technologies, driven by increasing incomes, urbanization, and favourable government support.

[44] https://data.worldbank.org/country/bangladesh
[45] https://www.cleancookingalliance.org/country-profiles/focus-countries/6-bangladesh.html
[46] The term usually refers to stoves that are burning firewood, charcoal, agriculture residues or dung.

CLEAN COOKING TECHNOLOGIES IN BANGLADESH

Fuel and/or cookstove stacking is very common globally, and in Bangladesh 75 percent of households nationwide that use firewood also use other biomass fuels. 55 percent of clean stove users in rural areas and 10 percent of users in urban areas also continue to use traditional biomass stoves, depending on the time of the day, cultural predilections and habits, and convenience (ESMAP 2019).

FIGURE 34
Rural and urban fuel use in Bangladesh (2018)



Source: Bangladesh Bureau of Statistics (2018)

Almost 74 percent of the rural population relies primarily on biomass fuels for cooking, which includes straw/leaf (28.6 percent), husk/bran (4.0 percent), and jute stick/wood/bamboo (41.2 percent)[47] (Figure 34). Lack of technological awareness and affordability gaps have led to low penetration of modern technologies like LPG and electric stoves, in both rural and urban areas. The transition towards cleaner solutions has been quite slow in the urban segments as well, with half the Bangladeshi population still depending on biomass. Approximately 300,000 households, (approx. 1 percent of the total) own electric cookstoves, the uptake of which is slow due to high usage costs.

Around 4 million households (or 9 percent of total[48] households) are connected to piped natural gas (sourced from Liquefied Natural Gas, LNG,). In 2016–17, the government suspended additional installations of LNG connections to households owing to depleting reserves and increased demand from the industrial sector, giving way to substitute technologies like LPG.

A market-based approach in conjunction with government promotions and schemes, such as tax exemptions for LPG imports including a waiver of the 15 percent duty on the import and reduction in Advance Income Tax (AIT) from 5 percent to 2 percent (Financial Express 2018), has led to an annual growth rate of 8–10 percent in LPG adoption nationwide. Despite this growth, challenges remain in this form of high upfront and refill costs, safety hazards and accessing remote rural areas.

Improved cookstoves (ICS) in Bangladesh come in many variants of fuel (pellets, briquettes, ethanol, solar) and build structure (cement/clay/concrete, fixed/portable, and locally manufactured/imported). Despite its significant fuel-saving potential and a very low-cost recovery period of three to four months, uptake has not been substantial, with only 10 percent nationwide adoption (Table 4). ICS offers huge potential in remote and inaccessible areas. However, more research and investment are required to transform ICS from basic to advanced models such as briquette, solar and pellets, and to increase adoption.

[47] Bangladesh Bureau of Statistics (2018) Bangladesh Sample Vital Statistics 2018.
[48] Khan, M.F.R. (2018). BPC Study Report.

TABLE 4
Current usage, targets and projections

Technology	Current Usage (2017–18, ~35 million households) as % of total households	2030 Targets (Projected ~50 million households)
LPG-based stoves	15%	55%-65%
LNG-based stoves	10%	10%
Improved cookstoves	10%	40%
Electric stoves	1.1%	7.5%
Biomass-based stoves	74%	**Projected at ~30%***

Note: Totals may not add up to 100% due to stove stacking.
Source: National Action Plan for Clean Cooking in Bangladesh 2020–2030.
*Under business-as-usual scenario.

Owing to high dependence on the agricultural sector (~40 percent), biogas presents a significant opportunity for expansion and rural penetration (Statista[49] 2020). The enormous amount of agricultural and cattle waste generated in Bangladesh, coupled with the decentralized nature of biogas production, makes for a reliable opportunity. The Government of Bangladesh, through Infrastructure Development Company Limited[50] (IDCOL), has been providing subsidies to establish biogas plants across the country (Siddique 2017); approximately 102,000 biogas digesters had been installed by 2018. However, inherent challenges related to the installation of the plants, land availability, and high upfront costs still need to be addressed to include biogas as a mainstream solution.

Under a business-as-usual scenario, 30 percent of Bangladeshi households will continue to rely on biomass for fuel in 2030. There is a need to steadily redesign the existing policy and financing framework to achieve the vision of zero biomass use by 2030.

[49] https://www.statista.com/statistics/438360/employment-by-economic-sector-in-bangladesh/
[50] IDCOL is a government owned non-bank financial institution under the Ministry of Power.

CLEAN COOKING POLICIES AND FINANCING LANDSCAPE IN BANGLADESH

In 2013, Bangladesh's first Country Action Plan for Clean Cookstoves[51] (CAP 2013) focused predominantly on the removal of existing financing barriers by enabling access to capital by small and medium-sized enterprises (SMEs), promoting access to climate funds (such as GCF), leveraging government funds to finance women-led businesses in the sector and lobbying for additional financing options from international donors at lower rates (CAP 2013). However, the results have shown mixed success.[52]

Most financing to the clean cooking sector from development finance institutions (DFIs) is focused on ICS. For instance, the Improved Cook Stove Program — pioneered by IDCOL with support from the World Bank and the Government of Bangladesh — had installed 1 million ICS by 2017 in its first phase. IDCOL is now implementing phase II of the programme for the dissemination of 5 million ICS by 2021, financed by grants from the Green Climate Fund (GCF) and credit from the International Development Association (IDA). The second phase focuses on tier 2 and higher technologies, market promotion to build awareness, and supply chain development activities.

Another key initiative to promote ICS is the 'Market Development Initiative for Bondhu Chula', led by the Department of Environment with financial support from the Bangladesh Climate Change Trust Fund (BCCT) and GIZ.[53] The project employs local micro-entrepreneurs as its distribution and supply chain networks, which not only generates employment but also addresses issues of cost and affordability. Carbon financing has been used to subsidize stove installation and provide after sales services, as well as training for local employees. Details of the major programmes implemented in Bangladesh are listed in Table 5.

Furthermore, the government has a subsidy/safety net programme, implemented by IDCOL for promoting renewable energy solutions (including ICS), called KABITA, which promotes free distribution of these cookstoves often affecting commercial viability of other technologies. IDCOL, under the Domestic Biogas Program, is also providing credit of up to 80 percent of the total loans processed to households at 6 percent interest per annum (equivalent to the risk-free rate) – a step in the right direction to promote other clean technologies.

Financing from DFIs is mainly focused on ICS technologies in Bangladesh with limited private sector participation, highlighting the need to focus on diverse technologies and financing mechanisms and to address policy uncertainties.

Except for private businesses in the LPG sector, private sector financing and participation is missing in Bangladesh's clean cooking sector. While LNG was phased out starting in 2016/17, a high-powered government committee recently observed that LNG was more economically viable than LPG in urban areas, and has posited that the government imports the required quantity of LNG and builds sufficient terminals to cope with rising demand (Financial Express 2020). Such policy uncertainty poses risks, which have the effect of pushing away public and private finance from the sector.

[51] Developed by the Government of Bangladesh in partnership with the Clean Cooking Alliance, NGOs and private sector players, with the objective of 100 percent access to clean cooking by 2030
[52] National Action Plan for Clean Cooking in Bangladesh 2020–2030, Sustainable and Renewable Energy Development Authority (SREDA).
[53] Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH.

TABLE 5
Clean cooking initiatives and financing

Programmes Implemented	Technology	Implementing Entity	Key Partners	Project Costs and Financing	Timelines	Additional Details
Global Clean Cooking Program – WB IDCOL programme under RERED II	>Tier 2 Improved Cookstoves (ICS)	Infrastructure Development company Limited (IDCOL)	World Bank (International Development Association)	Total project cost: USD 386 million with USD 82.1 million for the clean cooking interventions: GCF Grant: USD 20 million IDA concessional loan: USD 20 million Parallel Financing from rural households: USD 42.1 million	Phase 1 2013–2017 Phase 2 2017–2021	Phase I – 1 million ICS Phase 2 – 4 million ICS
Market Development Initiative for Bondhu Chula	2 pot Cement based ICS with chimney (fuels include biomass and solar)	Bondhu Foundation (BBF)	Bondhu foundation, GIZ, Department of Energy Netherlands Development Organisation (SNV), Retail Partner organizations, NGOs	First Phase GIZ: USD 7.5 million for salary, training, promotional activities BCCT[54]: USD 3.2 million for subsidy, entrepreneur support and incentive Second Phase GIZ: USD 8 million for all cost except subsidies BCCT: USD 1.3 million for subsidies/incentives	Phase 1 2012–2014 Phase 2 2015–2016	Disbursed 2.6 million stoves, reaching more than 5.4 million people
Carbon Offset Improved Cook Stoves Project	2 pot cement based ICS with chimney (fuels include biomass and solar) incl. awareness programmes	Bondhu Foundation (BBF)	UNICEF, Marks and Spencer's	First Phase UNICEF: BDT 500 subsidy/per chula (USD 6.5/chula) Second Phase UNICEF: ~USD 1 million	Phase 1–2014 Phase 2 – 2014–2016	40,000 households from 8 districts.
Domestic Biogas Program	Biogas digestors	Government of Bangladesh (GoB), IDCOL	SNV Netherlands, KFW and World Bank	IDCOL: BDT 13,500 investment subsidy Loan to household 80% of the cost at a concessionary rate	2006 onwards	102,000 biogas plants as of 2018

[54] The Bangladesh Climate Change Trust (BCCT) was established on 13 October 2010 through the passage of the Climate Change Trust Act, 2010. The Government of Bangladesh has allocated USD 400 million to the fund.

BARRIERS AND PATHWAYS TO INCREASED CLEAN COOKING ACCESS

Following its partial success in 2013, the new National Action Plan for Clean Cooking in Bangladesh (2020–2030)[55] is currently being formulated. The plan aims to achieve 100 percent clean cooking access by 2030 and posits a total investment requirement of USD 2.9 billion over the next 10 years. This includes USD 0.86 billion in public and private sector investments and USD 2.01 billion of consumer expenditure financing. The sheer magnitude of required investments necessitates a well-integrated national energy access plan to ensure coordination across private and public capital providers and sectors and a diverse range of technologies.

The new National Action Plan for Clean Cooking must promote innovative business and financing models for different technologies, while ensuring an enabling environment with easy access to supply- and demand-side financing.

ENSURE PRICE AND COST PARITY BETWEEN TECHNOLOGIES TO ATTRACT PRIVATE SECTOR CAPITAL IN THE SECTOR

Government policies and incentives must provide an even playing field for all technologies. While the government (through IDCOL) is promoting biogas plants, awareness campaigns and promotional schemes to date have been focused on ICS and LPG. Low sensitization to other technologies, such as ethanol and pellet-based ICS, and electricity-based cooking, results in scarce seed funding for small and micro businesses, increases the cost of customer acquisition, and stifles innovation. Also, DFI funding, owing to the long-running IDCOL ICS programme, is disproportionately higher for ICS technologies, and DFIs should consider supporting new technologies and financing mechanisms.

The government's Economic Relations Division (ERD), as the National Designated Authority (NDA), has been very active in approving participation in Clean Development Mechanism (CDM) projects. Bangladesh has a unique opportunity to leverage existing carbon financing activities to support clean cookstove programmes. However, it is important to acknowledge that CDM project implementers providing free cookstoves can distort markets, leading to risk and asset misallocations. Therefore, a calibrated approach is needed to ensure that the market for other technologies and players is not distorted by perverse incentives.

THE POTENTIAL OF NEW FINANCIAL SOLUTIONS AND PAYMENT MECHANISMS IS YET TO BE EXPLORED

Despite multiple government initiatives to advance the sector, access to short-term finance has been an impediment for various actors. Key needs on the supply side include financing for capital investment (like R&D processes, machinery), developing distribution chains, and working capital. For instance, currently the small LPG distributors procure credit lines and purchase in cash from large LPG conglomerates, while these distributors in turn sell on retail credit to households. Large LPG companies do not necessarily provide corporate guarantees to the distributors, which results in default risk being borne by the retailer entirely. On the demand side, commercial loans and consumer financing have

[55] National Action Plan for Clean Cooking in Bangladesh 2020–2030 (to be published).

been underwriting the growth of the cookstove sector (SEforALL 2017). The need for collateral and high interest rates has been a major barrier to accessing finance. Microcredit, subsidized loans and credit guarantees in the sector are still quite underdeveloped and uncommon.

One of the solutions to this financing problem is direct capital access for households through microfinance institutions (MFI) and commercial banks. In fact, a systemic review conducted in Bangladesh postulates that microcredit access to end users is strongly associated with ICS adoption (Lewis and Pattanayak 2012). In Bangladesh, Grameen Shakti has spearheaded a mechanism where it sources biogas and cookstove components itself and provides low-cost financing[56] to the end user, leveraging its in-house financing approach and supply chain network. While the MFI sector is relatively mature in Bangladesh, there are currently not many scaled examples of MFI lending for stove purchases (ESMAP 2015).

Furthermore, automations across the value chain, which are likely to benefit smaller players to reduce their distribution costs, are yet to be successfully explored in the sector. For instance, Paygo energy is collaborating with Omera, a large LPG player, to introduce smart metering to remove cost barriers. With 'pay as you go' smart metering for cylinders, the customers pay an initial installation fee and subsequently purchase gas credits using mobile money. It also enables retailers to monitor usage conveniently. But such examples are few and far between in Bangladesh. The adoption and scale up of such technologies and innovative business models can circumvent the barriers of access and affordability, which can be explored in the medium to long term.

STOVE AND FUEL STACKING – A RURAL REALITY – TO BE SUPPORTED WHILE SPREADING AWARENESS ABOUT CLEANER COOKING FUELS

In the near to medium term, diverse fuels and technologies are likely to be used simultaneously, especially in semi-urban and rural centres. Evidence suggests that stove-stacking households tend to prefer traditional stoves over cleaner alternatives (60 percent of the cooking time). This practice often interferes with the benefits of modern cooking solutions. Notwithstanding the disadvantages, stove stacking is convenient, and essential, for deriving maximum benefits out of the present situation characterized by income limitation and uncertainty, as well as difficulty to access fuel and traditional cooking habits, among others. The practice can be encouraged if it is complemented with efforts to sensitize the population and the government of its health impacts and co-benefits respectively. School curriculum and pedagogical methodologies can play a role in instilling awareness around health outcomes related to the use of cleaner technologies.

RURAL AND URBAN SECTORS WILL REQUIRE DIFFERENT INTERVENTIONS

Policymakers must be cognizant that a transition toward a cleaner future for rural households may look very different from that of their urban counterparts. Most rural households primarily rely on the lower tiers of cookstoves with ~78 percent using tier 1 stoves while the urban areas consist of higher tier households with more than 40 percent relying on tier 4 cookstoves. While convenience in usage and cost are the common considerations across segments, differences in income structure, quality of life, and access to fuel may call for different approaches. Bangladesh's latest national action plan for clean cooking must address these disparities between the segments by aligning investments and policy decisions with appropriate technologies.

[56] It provides flexible payment options to customers like a 50 percent down payment followed by monthly instalments.

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