

India's Community Kitchens and Clean Cooking Nexus



Smokeless Cookstove Foundation
Report | June 2020



Photo courtesy: Rhea Gupte, Smokeless Cookstove Foundation; Shot during a field intervention in Bundelkhand, Uttar Pradesh; 2017

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Finally, the team would like to thank the field team at Smokeless Cookstove Foundation for sharing their inputs on the ground-level realities faced by users of traditional cookstoves in the hamlets of Uttar Pradesh, Madhya Pradesh and Maharashtra.

About Smokeless Cookstove Foundation

The Smokeless Cookstove Foundation (SCF) is a Non-profit Organisation working towards curbing the problem of Household Air Pollution. With its training program - the Smokeless Cookstove Revolution, SCF seeks to train the rural, migrant and tribal population with the skill of making a 'virtually zero-cost, efficient & improved cookstove' that has a considerably reduced smoke output based on the principles of Rocket Stove Technology.

SCF's training program Smokeless Cookstove Revolution (SCR), imparts skills and knowledge required in making a virtually zero-cost, improved cookstove that significantly reduces the indoor emission of noxious fumes and use of biofuel input. Based on the Rocket Stove Technology, the Stove uses far less fuel than traditional cookstove and emits lesser fumes, improves efficiency and reduces cooking time so that the family members can use the rest of the time for furtherance of their livelihood (Daily wage, education, etc.)

The raw materials used include locally available mud or clay, cut dry grass, rice puffs, cow dung and bricks. Individual metal moulds with specific dimensions are used to make the base for the cookstove – also known as the doughnut. The metal mould manufacturers for under INR 500 (~USD 7) and after that are used to make several hundred stoves.

While the cookstove does not compete with other models of the Improved Cook Stoves available in the market, the solution provides immediate adaptability as it is not very different from a traditional cookstove and is a 'no-cost' solution.

Purpose of the report

This report has been compiled to support the new product development process of an efficient community cookstove at Himalayan Rocket Stove. The product is based on Rocket Stove Technology and will aim to address the gap in clean cooking solutions within the community context. The report attempts to highlight players in the community cookstove ecosystem and identify potential consumer bases for the HRS community cookstove concept.

The methodology used to compile this report is a combination of primary and secondary research. The desk research was supported by telephone and email interviews with key players in the clean cooking ecosystem in India which includes manufacturers of cookstoves, head cooks at relief camps. The team also included inputs from the field team at Smokeless Cookstove Foundation to get a stronger understanding of the use of community cookstoves in anganwadis.

This report highlights inadequate policy action toward improving the type of cookstoves used in community kitchens - a category that impacts a large section of India's population, both in rural and urban areas. It draws attention to the impact of traditional highly polluting cookstoves in anganwadis on the health of children and seeks to draw attention to the urgency in reversing the decades-old trend of using mud- and brick- based cookstoves in these establishments.

The study underlines the gap in effective solutions in the community cookstove category and talks about the need for enhanced collaboration within the clean cooking ecosystem for the development of products that are cleaner, safer and more efficient. The research strongly suggests that an increase in organised efforts towards designing, standardising and building awareness through methods driven by behavioural insights would go a long way in creating a demand for improved community cookstoves and also in sustaining their adoption by the end user.

Finally, the report makes recommendations on the roadmap for HRS with its new product for community kitchens and for the industry in general.

This report is meant for internal study only and has been put together by the research team at Smokeless Cookstove Foundation - Rhea Mukerjee, Ajay Sharma and Nitisha Agrawal. No content from this report can be published externally without the approval of the research team.

Abbreviations

AAP	Aam Aadmi Party
AAY	Antyodyaya Anna Yojana
BC	Backward Classes
CEEW	Council on Energy, Environment and Water
CSE	Centre for Science and Environment
DNES	Department of Non-Conventional Energy Sources
GIZ	Gesellschaft für Internationale Zusammenarbeit GmbH
HAP	Household air pollution
HH	Household
HRS	Himalayan Rocket Stove
ICS	Improved cookstoves
IMHE	Institute for Health Metrics and Evaluation
ISO	International Organization for Standardization
LPG	Liquefied Petroleum Gas
MNRE	Ministry of New and Renewable Energy
NGO	Non-Governmental Organisation
NPIC	National Program for Improved Cookstoves
NSSO	National Sample Survey Office
PAHAL	Pratyaksh Hanstantrit Labh
PMUY	Pradhan Mantri Ujjwala Yojana
R&D	Research and Development
SC	Scheduled Caste
SCF	Smokeless Cookstove Foundation
SDG	Sustainable Development Goals
SDRF	State Disaster Relief Fund
SHG	Self Help Groups
TN	Tamil Nadu
TLUD	Top-lit updraft gasifier
UNDP	United Nations Development Fund
UT	Union Territory
WHO	World Health Organisation
WWF	World Wildlife Fund

Table of contents

Clean Cooking - An Overview	6
Access to clean cooking solutions	6
Standardised definition for clean and efficient cooking	7
Clean cooking stakeholders	7
Types of cookstoves in the market	8
Health impacts of traditional cookstoves	10
Government interventions supporting clean cooking in India	11
Scenario mapping: Community kitchens	13
Community kitchens in India	14
Market scan of India's community cookstoves segment	18
Survey analysis	24
Conclusions from community kitchens surveyed	26
Conclusions from the cookstove manufacturers surveyed	31
Challenges and opportunities for manufacturers	36
Recommended strategic approach for HRS	37
Annexure	42

Clean Cooking - An Overview

Inefficient cooking is a root cause of poverty, poor health, gender inequality, environmental degradation, air pollution, and contributes to climate change. Universal access to clean and modern cooking is integral to reducing poverty and advancing human dignity. In the 2017 SDG Progress Report, Secretary-General Guterres cited household and ambient air pollution as the greatest environmental health threat facing the world today, which cannot be addressed without significant progress on access to clean and modern cooking (UN Sustainable Development, 2018).

According to the Indian Census, in 2001, over 70 percent of all households in India and 90 percent of households in the country's poorer, rural areas used traditional solid fuels.

Access to clean cooking solutions

Access to cooking solutions is affected by factors such as variations in type and quality of fuel used, variations in cooking practices, proper use of equipment, and the size of the kitchen and the degree of ventilation. In essence, access to energy for cooking refers to the usability of the cooking solutions in the context of the various attributes mentioned above and with an emphasis on end users' experience, and not just the availability of a clean cooking fuel or technology (UN Sustainable Development, 2018).

Through consultations and inputs from multiple agencies, a new multi-tier framework (MTF) for measuring access to energy for cooking has been developed by the United Nations, which includes six attributes: cooking exposure, efficient heat, convenience, cookstove safety, affordability, and fuel availability. This Global Tracking Framework was adapted to an Indian context by Jain et al. (2015a) using the following dimensions:

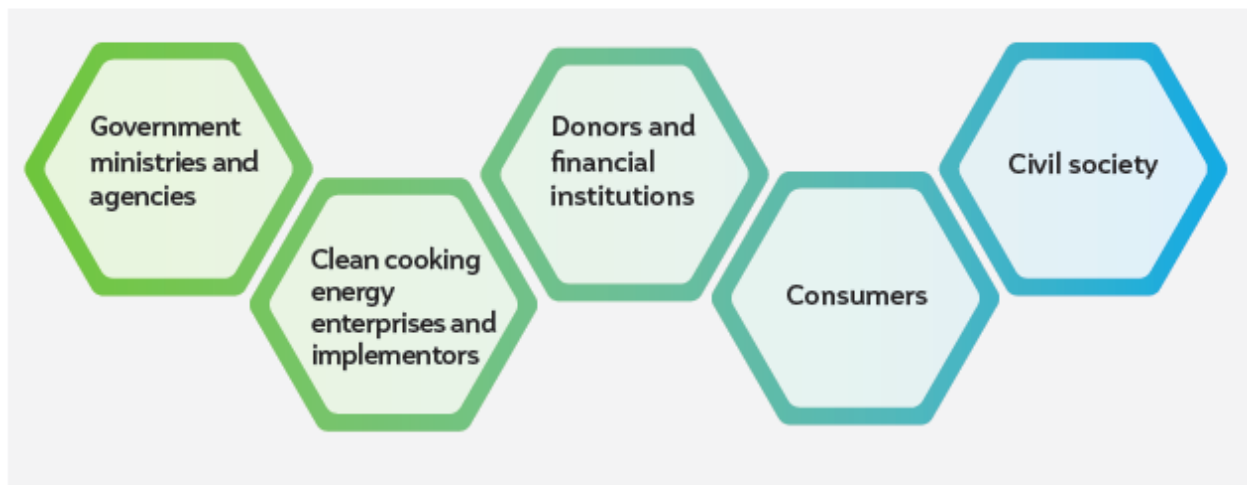
1. Health and safety, pertaining to the health and safety impacts of HAP for each source of cooking energy
2. Availability of the primary cooking fuel to the household on a regular basis
3. Quality of cooking associated with the primary cooking arrangement
4. Affordability of cooking energy source(s) when contrasted with the total monthly household expenditure
5. Convenience of cooking, pertaining to the time taken for cooking and the ease of handling cooking appliances

Standardised definition for clean and efficient cooking

The Global Alliance for Clean Cookstoves developed a set of definitions for “clean” and “efficient” for the specific purpose of tracking progress towards their key milestone (100 million households adopting clean and efficient stoves and fuels by 2020).¹

1. Stoves/Fuels that meet Tier 2 for efficiency or higher will be counted as efficient;
2. Stoves/Fuels that meet Tier 3 for indoor emissions or higher will be counted as clean, as it relates to potential health impacts; and
3. Stoves/Fuels that meet Tier 3 for overall emissions or higher will be counted as clean, as it relates to potential for environmental impacts
4. Tier 4 is always the highest performing and most likely to achieve the greatest health or environment benefits.

Clean cooking stakeholders

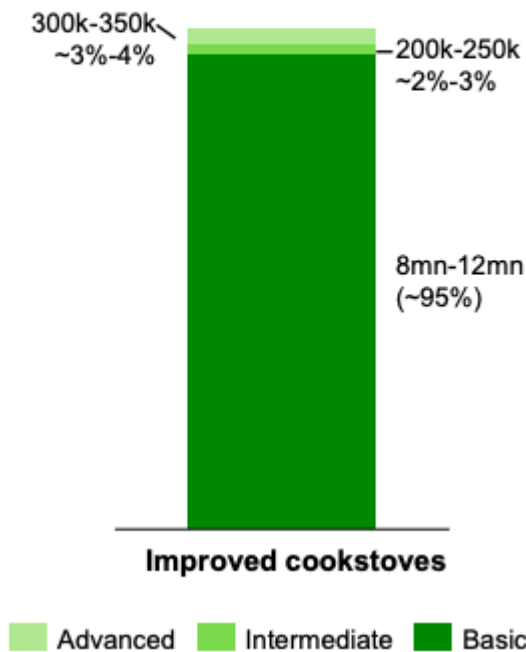


Source: CEEW analysis, 2018

¹ How does the Alliance define “clean” and “efficient”? Clean Cooking Alliance, <https://www.cleancookingalliance.org/technology-and-fuels/standards/defining-clean-and-efficient.html>

Types of cookstoves in the market

Estimated ICS penetration
(millions of stoves, % of ICS market)



A vast majority of the population still uses basic cookstoves in India favouring traditional cooking methods over others. **Collection of firewood/biomass and the implications on their health** put a huge burden on women, but these fuels are either free or inexpensive in most cases. This compensates for the ill-effects of using solid fuels from an economics standpoint. Moreover, the woman's time and health impacts of biomass burning are not accounted for in such calculations.

Next is the factor of **reliability**. Cooking as an activity is undertaken daily, between 2-3 times a day, usually on schedule. The present-day on-demand supply of LPG, especially in remote locations, is still not that well

established. While LPG is an aspirational fuel, it is biomass that keeps food on the table, day after day.

Global Alliance for Clean Cookstoves identifies six categories of cookstoves in India. These have been bifurcated on the basis of their technology, fuel type and ISO rating.²

I. Traditional cooking

Stove type: Traditional stoves

Description: Traditional stoves with very baseline technologies, using solid fuels, are inefficient and injurious to health

Examples: Three stone fires, Basic non improved chulhas, Unvented coal stoves

ISO rating: ISO tier 0

II. Improved cooking solutions

² Dalberg Global Development Advisors, "India Cookstoves and Fuels Market Assessment", Global Alliance for Clean Cookstoves, 2013.

A. Stove type: Basic ICS

Description: Rely on solid fuels and have relatively limited benefits beyond improved fuel efficiency. Often don't reach beyond 25% fuel savings

Examples: Basic improved chimney chulhas, Basic biomass portable stoves, Basic vented coal stoves

ISO rating: ISO tier 0 - 1

Manufacturers:

(i) Chimney solid fuel stoves - Appropriate Rural technology institute, TARA,

(ii) Portable wood and charcoal stoves - Sustaintech, Vikram Stoves and Fabricators

B. Intermediate ICS

Description: Improved efficiency of combustion of fuel and emission gases, typically with rocket principles and (often) higher end materials. Significant fuel savings, up to ~50%. **HRS falls under this category.**

Examples: Rocket stoves, Highly improved charcoal stoves, Highly efficient coal stoves

ISO rating: ISO tier 1- 2

Manufacturers: Envirofit, Greenway, Prakti

III. Clean cooking energy

A. Stove type: Advanced ICS

Description: Gasifier biomass stoves using natural draft principles or with fans; emerging TEG/charging features

Examples: Natural draft gasifier (TLUD or sideload), Fan gasifiers

ISO rating: ISO tier 2-4

B. Stove type: Modern fuel solutions

Description: Non-biomass stoves relying on liquid / gas fossil fuels or electricity

Examples: LPG, Electricity, Kerosene, Natural gas

ISO rating: ISO tier 3 - 4

IV. Renewable energy solutions

Description: Sustainable fuel or stove solutions that rely on renewable energy sources. Often part of stove/fuel system

Examples: Biogas, Biofuels / ethanol, Solar / retained heat cookers

ISO rating: ISO tier 3 - 4

Health impacts of traditional cookstoves

Diseases and respiratory infections

Exposure to household air pollution (HAP) contributes to myriad diseases including acute lower respiratory infections in young children and lung cancer, ischaemic heart disease, chronic obstructive pulmonary disease, and stroke in adults. The health and wellbeing (Goal 3) of women, children, and infants are disproportionately compromised by HAP; research suggests that cooking with biomass fuels may increase blood pressure in pregnant women, cause lower birth weight of infants, and increase incidence of childhood pneumonia.

According to Jain et al. (2015a), 72 per cent of households that use solid biomass are aware that it has adverse impacts on their health. Despite that, only 59 per cent believe that LPG has positive health benefits over traditional cooking fuels. This practice of opting for an affordable cooking method over a healthier but more expensive model was echoed in the feedback shared by respondents to the survey done by SCF.

Disproportionate impact on women and children

Among women and children worldwide, indoor pollution accounts for an estimated 1.5 million premature deaths each year (WHO 2006a). In India, the comparable figure, according to recent estimates, is at least 800,000 premature deaths every year (IHME, 2016).³

In addition to these illnesses, polluting and unsafe fuels pose substantial risks for burns and injuries.

Personal safety risks and injury

Fuel collection over long distances with heavy loads can result in personal safety risks and injury.

Perpetuates gender inequality

Traditional cooking also poses barriers to women's and girls' equality, since they often spend long hours in routine unpaid caregiving work each day caring for their families which includes household chores such as cooking, cleaning, and collecting water and firewood - time that could otherwise be spent on income generating activities, education, or recreation.

³ Patnaik, Sasmita, Saurabh Tripathi, and Abhishek Jain. 2019. Roadmap for Access to Clean Cooking Energy in India, New Delhi: Council on Energy, Environment and Water.

Government interventions supporting clean cooking in India

The 68th round of the NSSO (2011–12) revealed that over two-thirds of households in rural India still relied on firewood and cow dung for their primary cooking fuel needs.

The Government of India has made efforts to enhance access to clean cooking energy by promoting biogas, improved cookstoves (ICS), and LPG through various policies and programmes. It has launched three major national initiatives (since 2014)—PAHAL, Give it Up, and Ujjwala—to expand use of LPG in households. The following section elaborates on some key programmes launched by the government of India towards clean cooking. Of these, Unnat Chulha Abhiyan and ARTI/Samuchit Enviro-Tech Cookstove Program address community kitchens.

1. Pradhan Mantri Ujjwala Yojana (PMUY)

The most prominent among these is the Pradhan Mantri Ujjwala Yojana (PMUY) which has provided subsidised LPG connections to over 77 million households (as of August 2019).

However, a recent study by Jain et. al (2018) in six of the most energy access-deprived states—Bihar, Jharkhand, Madhya Pradesh, Odisha, Uttar Pradesh, and West Bengal—suggested that only about one-third of the rural population use LPG as their primary cooking fuel.⁴

Stoves in most anganwadis⁵ are manually-built brick and mud structures reinforced with clay. They have an opening on two sides, one for adding solid fuel and the other for letting the smoke escape. They are usually built by the sahayika and the sevika assigned to the anganwadi. A single stove can last about 6–8 months.

2. Unnat Chulha Abhiyan

National Programme launched in June 2014 for promotion of improved biomass cookstoves in all the State/UTs for providing clean cooking energy solutions and reducing drudgery of women and children and emissions. The implementation of this programme is to be done by State Nodal/Implementing Agencies, State Departments, NGOs, business development organization

⁴ Patnaik, Sasmita, Saurabh Tripathi, and Abhishek Jain. 2019. Roadmap for Access to Clean Cooking Energy in India, New Delhi: Council on Energy, Environment and Water.

⁵ *Anganwadi* is a type of rural child care centre in India. They were started by the Indian government in 1975 as part of the Integrated Child Development Services program to combat child hunger and malnutrition.

etc. Its target users are: (i) Households (ii) Kitchens of Mid-day Meal Schemes, Angandwadi, Forest Rest Houses, (iii) Tribal/SC/BC Hostels etc. and (iv) Roadside *dhabas* and small hotels. Under this programme, special finance assistance schemes are outlined according to which community cookstoves are deployed for anganwadis, tribal kitchens and mid day meals. 33 Models and 18 manufacturers of improved cookstoves approved by MNRE for deployment under this programme.

3. National Program for Improved Cookstoves (NPIC) - 1984-2002

The national pilot project for the demonstration of improved cookstoves, was designed and launched by the Department of Non-Conventional Energy Sources (DNES) with the following objectives:

- to conserve and optimize the use of fuelwood, especially in the rural and semi-urban areas,
- to help alleviate deforestation,
- to reduce the drudgery associated with cooking, especially on women, and the health hazards caused by smoke and heat exposure in the kitchen,
- to bring about improvements in household sanitation and general living conditions

The programme was implemented through state government agencies, autonomous bodies and voluntary organizations. Self-Employed Workers were engaged in improved cookstoves construction and were responsible for installation, maintenance, and obtaining feedback as well as following up the improved cookstoves installed for a period of one year. NGOs were engaged in the implementation with the support of village level administrative officers. 20 Technical Back-up Units were created in various educational institutions, eg. engineering and agricultural colleges, autonomous agencies for carrying out R&D work.⁶

4. National Biomass Cookstoves Initiative - 2009 - present

India has recently launched the National Biomass Cookstoves Initiative (NCI) to develop next-generation cleaner biomass cookstoves and deploy them to all Indian households that currently use traditional cookstoves. The initiative has set an aim of providing energy service comparable to clean sources such as LPG but using the same solid biomass fuels commonly used today.

5. ARTI/Samuchit Enviro-Tech Cookstove Program - 2001 - present

ARTI, Maharashtra's technical backup unit, initiated an entrepreneurship training and development program for traditional potters to participate in the design, promotion, and sale of stoves. This innovative approach focused on the development of easy-to-assemble portable

⁶ Food and Agriculture Organisation, Bangkok, "Regional wood energy development programme in Asia: Indian improved cookstoves - A Compendium", 1993
<http://www.fao.org/3/AD585E/ad585e00.pdf>

molds for making improved stoves, setting up an entrepreneurship development program for traditional potters, and training potters in the installation of community stoves.⁷

There are provisions in Indian constitution under Part IV-directive 47 which states that it is the duty of the state to raise the level of nutrition and standard of living and to improve public health. Although not enforceable by law, it does obligate the Government of India to provide adequate provisions for food to its citizens and Indian government does have a comprehensive food subsidy policy to serve its citizens. But due to lack of proper implementation, the policies are failing at their objective. One such example is Antyodaya Anna Yojana (AAY) which was launched in 2000.

Scenario mapping: Community kitchens

Community kitchens or soup kitchens, meal centres, food kitchens are concepts where inexpensive and nutritious meals and often free food is provided to people who cannot afford it. These kitchens serve as a food security instrument for vulnerable sections of society such as the elderly, ill, disabled and those living in extreme poverty. They are also a source of inexpensive and nutritious food for those working in urban areas, from delivery personnel to rickshaw pullers. The lockdown and large scale unemployment caused by COVID – 19 has pushed India to the brink of a hunger crisis. Those worst hit are daily wage labourers, migrants, homeless, the poor and many who form the floating population of India. Community kitchens have emerged as an empirical food security solution for those in need.

⁷ Barnes et al. 2012. Cleaner Hearths, Better Homes, New Delhi: The International Bank for Reconstruction and Development/The World Bank



An anganwadi kitchen in Khandwa, Madhya Pradesh
From the archives of Smokeless Cookstove Foundation

Community kitchens in India

A well established concept

Among the earliest such kitchens in India was Maharashtra's "zunka-bhakar" scheme initiated in 1995 by the then Shiv Sena government. This was discontinued in 2007. Tamil Nadu has Amma's canteens, a chain of community kitchens with 300 branches across the state, serving approximately 2.5 lakh people per day, at a subsidized cost. Delhi has "Janata Aahar" outlets where meals at Rs. 15 are available. In 2015, the AAP government announced that they would set up 100 "aam aadmi canteens" across the city, modelled on the TN canteens mentioned above. Other such canteens were seen in Chhattisgarh, Jharkhan and Odisha (dal-bhaat kendra, recently cancelled) and most recently, in Uttarakhand.⁸

⁸ Reetika Khera, "Community kitchens: An idea whose time has come", *Scroll*, 22 January 2016, <https://scroll.in/article/801742/community-kitchens-an-idea-whose-time-has-come>



Amma's Canteen, Tamil Nadu

Source: The Print

COVID-19 relief kitchens

In response to COVID-19 and for the protection of the poor during this crisis, Finance Minister Nirmala Sitharaman announced that the central government has released Rs. 11,000 crore to states as part of the Centre's contribution to State Disaster Relief Fund (SDRF) which includes provision of cooked food thrice a day to lakhs of poor migrant workers.⁹

Community kitchens in India, particularly those that double up as relief centres during calamities like droughts, floods or a pandemic are unstructured, unorganised, ad-hoc structures. It is upto the organiser of the structure to procure funding, cooking appliances, fuel, food grains, cooks and a space for running these kitchens. The community kitchens that have been established across the country during COVID-19 follow several models: some cook in large kitchens and deliver packets across cities, others are makeshift models within populated neighborhoods (large halls, open groups, vacant schools etc.) that engage community

⁹ VS Pandey, "Old ways have to give way to new. Set up permanent community kitchens | Opinion", *Hindustan Times*, 20 May 2020, <https://www.hindustantimes.com/opinion/old-ways-have-to-give-way-to-new-set-up-permanent-community-kitchens-opinion/story-hAVE1YT59bwApCI80bNW8I.html>

volunteers. This is further highlighted in the report on the basis of an interview done with the head cook of one such relief kitchen running in Mumbai.

According to an official release by the Ministry of Rural Development: The presence of the Self Help Group (SHG) network in every *Gram Panchayat* and the linkage with Local Self Governments were important factors in assigning the operation of community kitchens/*Didi's* cafes to them. 10,000 community kitchens have been set up across five states of Bihar, Jharkhand, Kerala, Madhya Pradesh and Odisha, to name a few. These kitchens spread across 75 different districts have been providing meals twice a day to nearly 70,000 individuals who are vulnerable and needy. Other states are also running such initiatives.¹⁰ The COVID-19 relief community kitchens run by the state government in Kerala since April 2020 have been lauded for their impactful work of delivering 2.5-2.8 lakh food packets to the poor, free of cost.¹¹



Uttar Pradesh's covid 19 community kitchen

Roadblocks in the community cookstove segment

The community cookstoves segment is even more fragmented and unorganised than the household cookstoves segment. It additionally suffers from (i) low demand for improved methods, (ii) being ad-hoc, rapid response establishments, (iii) difficulty in procuring and sustaining fuel supply, (iv) financial constraints, (v) behavioural patterns that are difficult to

¹⁰ "Community Kitchens run by SHG Women provide food to the most poor and vulnerable in Rural Areas during the COVID-19 lockdown", *Press Information Bureau*, 13 April 2020, <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1613866>

¹¹ "Kerala's community kitchens serve 2.8 lakh food packets a day", *The Hindu Business Line*, 10 April 2020


change and, (vi) absence of standardization in product design or implementation. Furthermore, the segment is non-institutionalised which makes it difficult for manufacturers of community cooking stoves to scale up their products. According to a leading manufacturer of improved cookstoves in India, the challenge with adopting cleaner cookstoves is higher in the community cooking area as compared to households as the users require more guidance in operating these stoves.

The usual preference is for a traditional cookstove which is often placed in a semi enclosed area to protect it from rain and sunlight. The use of biomass is incredibly diverse across the country with people using whatever they can easily procure and store as fuel. Another important cultural factor to note is that people prefer to cook seated, usually in heat wasting pans without lids and do not prepare more than one dish at a time. Stove stacking/ secondary stoves as back-ups is another common feature stemming from energy access issues. (Global Alliance for Clean Cookstoves)¹²

¹² Dalberg Global Development Advisors, "India Cookstoves and Fuels Market Assessment", Global Alliance for Clean Cookstoves, 2013.

Market scan of India's community cookstoves segment

The table below identifies improved cookstoves made by some of the better known manufacturers in India. The details captured here include capacity of the cookstove, fuel efficiency, reduction of smoke emissions and type of fuel used, among other descriptors. However, we were unable to find the price points of some of these models through our desk research because they appear to be shared on request-basis. This challenge made it difficult for us to provide a suitable benchmarking on the price of cookstoves in the Indian market and further points towards the sector being highly fragmented and disorganised.

Vikram Chulha Jumbo Regular (chulha)	
Manufacturer	Vikram Stoves and Fabricators
Description	<p>Consumer type: Anganwadis, Hotels, <i>Dhabas</i>, Mangal Karyalayas.</p> <p>This is a front feeding cook stove made of mild steel and cast iron. It has a fuel efficiency of 25% and can be used to feed up to 100 persons. The fuel types used for this model are agriculture waste, biomass, firewood, dung cake and charcoal. The lifespan of this model is 3 years and it comes with a 1 year warranty.</p> 

Jumbo Super	
Manufacturer	Vikram Stoves and Fabricators
Description	<p>Consumer type: Anganwadis, Hotels, <i>Dhabas</i>, Mangal Karyalayas.</p> <p>This is a top feeding cook stove made of mild steel and cast iron. It has a fuel efficiency of 25% and can be used to feed up to 100 persons. The fuel types used for this model are solid agriculture waste, biomass, jungle/fire wood (4 kg for First Feeding and then as per requirements.) Charcoal is a</p>

highly recommended fuel. The lifespan of this model is 3 years and it comes with a 1 year warranty.



[Greenway Jumbo stove](#)

Manufacturer


Greenway Grameen Infra

Description

GreenwayJumbo Stove is a single-burner, high efficiency cookstove that works on all solid biomass fuels such as wood, dry dung, crop waste, coconut waste, bamboo etc. The model comes with a patented air regulation technology that leads to better combustion i.e. increased efficiency (65% fuel savings) and reduced smoke (70%). This mechanism is highly durable and does not have any moving parts. The stove does not require any fuel processing/cutting. It is constructed using steel and aluminium with handles made of bakelite. However, due to low demand, this model has been rolled back.




[EFI-100L](#)

Manufacturer	Envirofit
Description	<p>With three pieces of wood the stove can prepare a meal for 300 people in half the time. Its key features are a chimney, integrated stainless steel pot (100L), an insulated hot gas path, rust resistant combustion chamber etc. It comes with 80% fuel savings, 5X efficiency and up to 80% reduction in toxic emissions. The pricing of Envirofit community cookstoves ranges from Rs.35,000 to Rs. 65,000 per cookstove.</p> 

Saverpro Aghanya	
Manufacturer	Envirofit
Description	<p>Made for India, the SaverPro Aghanya is a powerful stove that can quickly (50% reduction in cooking time) feed schools, institutions and communities. An integrated forced-draft blower increases combustion efficiency so fuel lasts longer (80% reduction in fuel consumption) while reducing smoke (toxic emissions reduction upto 80%). The SaverPro Aghanya is a multi-fuel stove that burns wood chips, pellets and other biomass and has the capacity to feed up to 400 people. It has an estimated lifespan of 5 years. Pricing for the various community cookstoves by Environment are known to range from Rs. 30,000 to Rs. 60,000</p>



PYRO brand	
Manufacturer	TIDE
Description	<p>Sustaintech's flagship brand is the PYRO range of environmentally friendly fuel-efficient cook stoves. Their products are advertised to have the optimal balance between environmentally friendly and consumer friendly features that are incorporated into their technology. Their stoves cater to a variety of cooking tasks and fuel types. In keeping pace with recent trends and needs it has introduced a new range of ultra clean, forced draft stoves that use sized agro residues as fuel. Sustaintech took the designs from TIDE to implement them in multiple regions in South India. Their pricing ranges from Rs. 19,00 to Rs. 54,000 depending on the product variety.</p> 



Prakti Institutional stove	
Manufacturer	Prakti
Description	<p>Prakti's design team is currently working on a next-generation line of stoves which claims to have the best combustion efficiency of any biomass stoves in the world, combined with unprecedented ease of use for cooks. They are also prototyping creative new solutions for biomass cooking within the unique challenges of settlements for refugees and other displaced peoples. In the institutional cookstoves category, they currently have 3 sizes of stoves (on the basis of pot size): 240L, 80L and 40L. These stoves use only a quarter of the fuel and can fit different types of cooking utensils - regular pot, kadai and tawa.</p> <p>Mainly distributed by Prakti Design along with women training for local assembly of stoves. Prakti is currently pursuing direct sales as well as partnerships with organizations implementing successful rural distribution channels of stove. Online purchase available at Amazon India, Shopclues and The Charcoal Burner Company.¹³</p>

¹³ Engineering for Change, <https://www.engineeringforchange.org/solutions/product/prakti-single-burner-wood-stove/>



In addition to above manufacturers who have introduced community cookstoves as part of their solution, we have also identified examples of some independent innovators who are also part of this ecosystem.

V Jayaprakash is an innovator and entrepreneur from Kerala who has sold over 8k [eco-friendly stoves](#). This cookstove maker from Kerala has improvised the portable stove using techniques of complete combustion and gasification. It comes with a two-tier system of burning that ensures both, the biomass fuel and the smoke created from it are completely burnt, thereby creating less pollution. Jayaprakash's efficient and portable stoves are also easy on the pocket. While the 1kg stove costs Rs. 4,000, the 10kg one is priced at Rs. 15,000 (the largest 100 kg stove costs about Rs. 65,000).

The entrepreneur is also credited to have installed over 200 community stoves for preparing mid-day meals across various schools in Kerala in partnership with United Nations Development Program (UNDP). With over 1,000 of these sold already, Jayaprakash is always flooded with orders that come from various schools, community kitchens, marriage halls etc., from Tamil Nadu, Kerala and Karnataka.



Survey analysis

The Smokeless Cookstove Foundation team conducted interviews and informal discussions with players in the community cooking ecosystem to get a deeper understanding of the issues faced by community kitchens in India. Through a combination of primary and secondary research methods, we gathered insights from the following groups:

1. Cooks of community kitchens
2. Cookstove manufacturers with a community cookstove as a product offering
3. Cookstove distributors
4. *Anganwadis*
5. Roadside *dhabas* and tribal hostels

We conducted an informal interview with a manufacturer of cookstoves, Pollinate, that is currently running clean cooking/ clean energy programmes with migrant communities involved in daily wage earning opportunities in cities. The insights from this conversation gave us a clear picture of the gaps in the community cookstoves sector in India. His opinions resonated well with our desk research on the subject. **The feedback from Pollinate in this document are excerpts from an informal conversation and should not be quoted for the purpose of external publication.**

The respondent spoke from two aspects of his experience, (i) as a manufacturer of clean cookstoves with 10 years of experience in the market and, (ii) as an implementer of multiple clean cooking and lighting solutions for communities. According to him, the manufacturer did

not find much success in the community cookstove category due to reasons like product design, fuel requirements and costs. The following section summarises his feedback.

Technical & Product related obstacles

- Technology used for HH stoves was being transferred to a community cookstove, whether forced draft or natural draft
- The size of the feeder mouth for fuel. The community does not want to waste time in chopping wood to cater to a smaller feeder mouth. The problem is exaggerated for a community cookstove as it needs to cater to faster cooking and quick turnaround.
- Top-down approach of the manufacturer, without taking into account local needs. Communities need a solution that fits into their requirement or addresses their need gap rather than retrofitting the manufacturer's solution. Furthermore, the technical team rarely checked back with the community on usage and experience and hence there was no scope for feedback and improvement from a user's perspective.

Fuel-related

- Combined fuel options absent. Most communities where community cookstoves were tested, wanted to use both cow dung and wood, as their choice of fuel. The product offering could not cater to the issue of mixed fuel requirement. Specifically for establishments like anganwadis that use multiple cooking solutions (combination of mud cookstoves, LPG, ICS etc), if the stove comes with a combination solution, then it may have a chance to succeed.
- *Dhabas* are a coal using category so if a cookstove can offer that as a solution, then the adoption ratio could be favourable.

Price sensitivity & other benefits determining the adoption

- Community cookstove users like *dhabas* and messes are extremely price sensitive where the users want everything, but at a cheaper cost.
- Reduction in smoke is not the biggest determining factor towards switching to a cleaner solution for these establishments. It is the spends on fuel (fire wood) that drives the change. For instance, if a *dhaba* or a commercial kitchen sees a direct impact on their savings in wood purchase, they are more likely to make the shift.
- Pyro Tawa stove, multipurpose stove, tea stove etc. are different variants for specific applications. A target market needs to be defined for such products and solutions need to be demonstrated.
- Flexible payment scheme works well in this segment.

Conclusions from community kitchens surveyed

1. Community Kitchens

We spoke with two organisations that are currently running relief kitchens in India currently - Run for Migrants employed in the power loom industry at Bhiwandi, Mumbai and Mercy Kitchens, in Bangalore, with operations across the city.

Run for Migrants has a permanent kitchen catering to 5 lakh migrant workers employed in the power loom industry and also people living at a nearby slum cluster in Bhiwandi, Mumbai. Once the lockdown was announced by the Prime Minister of India, a majority of migrant workers travelled back to their villages. However, many were still living in the city but were left without monetary support and food. This kitchen started working once the lockdown was announced



and is funded by an NGO to cater to the communities who are in the vicinity of this kitchen.
Actual picture of the running Bhiwandi kitchen

The cookstove used here is a rented metal stand and the pot is a 25 kg - 30 kg copper cooking pot. The height of these pots are approximately 15inchs from the feeder. This kitchen has about 20 such cookstoves running.

- Procurement cost: The cookstoves and the pots are rented from vendors who supply this kind of cooking set up for large weddings, fairs and exhibitions. The per day rental cost is Rs 80 per cookstove, with the per day rental cost pegged at Rs. 1600 per day.
- Running capacity: The kitchen prepares 6500+ meals every day in this period. There are 16 people involved in running the operations with two people acting as head cooks. The team works almost four hours a day and prepares only one meal for the day.

- Fuel consumption and costs: As is clear from the picture, firewood is the only fuel being used. As per the head cook, LPG turns out to be an expensive option and hence a wood based cookstove has been the best option for this kitchen. The cost of procuring this fire wood has been stated as Rs 10 per kg with a daily requirement of almost 700 to 800 kgs.



Actual picture of a COVID-relief community kitchen in Bhiwandi

This is an outdoor set up so toxic emissions is not a concern. Based on the experience shared by the head cook, smoke is not a major cause of concern in this kitchen set up as it is operating in an outdoor space currently. When they move inside, the kitchen space is properly ventilated. The process of lighting and cooking is very fast as they do not need to cut the fire wood into small pieces and can immediately start the process of cooking. “It’s very important for us to prepare the food quickly, efficiently and without any wastage and hence this process works for us.” said the cook.

The fuel consumption is very high in the traditional cookstove currently in use. However, the cause of concern is the amount of firewood that the cookstove uses. As long as there funding is available, the cost factor can be ignored by the kitchen. However, if the kitchen team had to procure the firewood themselves, then the cost will be passed onto the consumer of the meal.

A respondent from Mercy Mission told us that they are currently running multiple community kitchens across Bangalore and some in the outskirts of the city. The locations of these establishments range from vacant community centres and halls to open grounds in the outdoors. 70 percent of these kitchens are temporary, makeshift. One of these kitchens is in a slum area and the location was chosen on the basis of access to beneficiaries under lockdown

circumstances. The choice of cookstove is determined by ease of availability, access to fuel in abundance and most importantly, affordability of fuel. The stoves used in the kitchens set up by Mercy Kitchens are traditional cookstoves.

Both respondents said that convenient, easy to operate and cleaner cookstoves are welcome at their kitchens. When asked if they would like to use an efficient cookstove that can reduce the fire wood usage and the smoke output at this kitchen, they were both very keen to do so. However, convenience and ease of use will be a big factor to determine the usability.

The absence of standards for emissions, safety, distancing and space in the working area is a gap that was observed by one of our respondents. This highlights the importance of developing a collaborative, organised community of experts in the community cookstoves category.

2. Anganwadi kitchens¹⁴

A study¹⁵ was done by CSE to ascertain the impact of switching from biomass-based solid fuels to cleaner liquefied petroleum gas (LPG) for cooking of mid-day meals in anganwadis in Bihar on reducing exposure of children to toxic air. Based on the results of a pilot scheme, the Bihar government is expected to expand the programme across the state. The rapid indoor air quality monitoring during cooking of midday meals on biomass-based cooking stoves has helped create a baseline of exposures.

As of 1 January 2015, there are 1.34 million operational anganwadi centres across India (CSE, 2016). A typical anganwadi kitchen is known to be roughly 6X14 ft.¹⁶ These cookstoves are either placed indoors near an open window or door. Or they are placed outdoors in a partially covered area to protect it from rains and high heat. Anganwadi kitchens in most parts of India rely on traditional mud- or brick-based cookstoves which pose a burden on the cook (usually women) and a health hazard to children at the facility, who are usually in the immediate vicinity of the cookstove from which toxic smoke is emitted. The SCF team had travelled to a highly marginalised area in Bundelkhand and witnessed the drudgery faced by women in households because of this problem.

¹⁴ We were unable to conduct a formal interview with an *anganwadi* kitchen for the purpose of this report. The following section has been developed on the basis of our desk research and our experiences while conducting field training programmes for SCF.

¹⁵ This study was commissioned for supporting the joint initiative of the Bihar government and Bihar chapter of the Indian Academy of Paediatrics along with UNICEF under which a pilot scheme to replace biomass-based stoves with LPG for cooking midday meals for children was initiated.

¹⁶ Anumita Roychowdhury and Polash Mukerjee. 2016. *Children in Chulha Trap: Eliminating Toxic Exposures in Anganwadis of Bihar*, New Delhi: Centre for Science and Environment



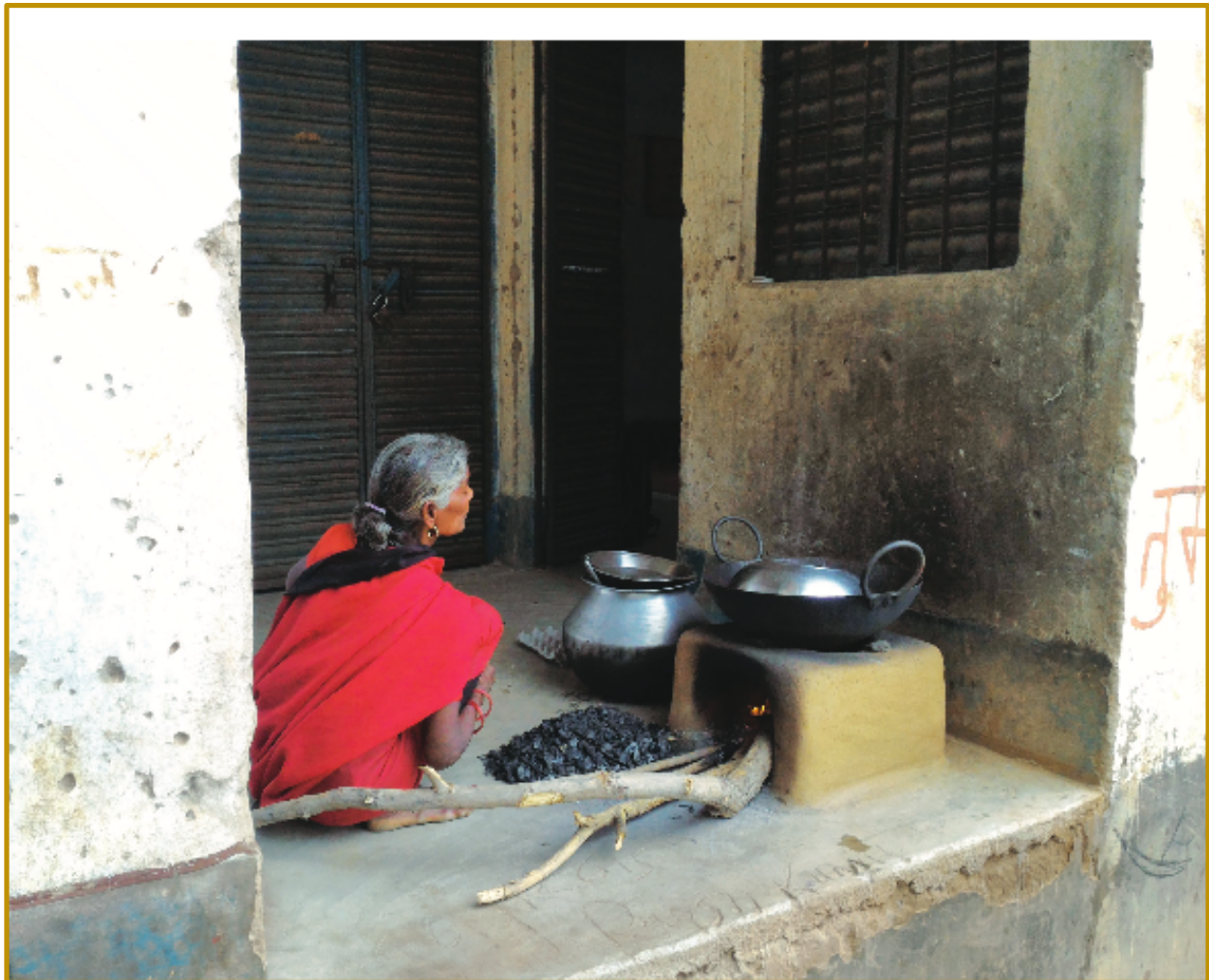
Meal being prepared by an anganwadi worker in a village in Bundelkhand, Uttar Pradesh
Photo courtesy : Rhea Gupte for Smokeless Cookstove Foundation

The above image suggests that the woman is cooking meals in a hazardous environment, day after day. Upon talking to her, the team discovered that her eyesight has been severely affected due to the emissions from the cookstoves and she had lost most of her vision.

The table below summarises the specifications of a basic/ traditional cookstove.

Fuel	Firewood
Pot size	36 to 24 inch diameter, flat bottom
Cooking capacity	300-400 (children)
Meal description	A meal comprises rice, dal and vegetables, cooked twice daily
Cooking duration	120 to 135 minutes (depending upon items)
Smoke and soot	Excessive
Ambient temperature	Very high

Exhaust from the kitchen	Through the door and windows if indoors
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A typical anganwadi kitchen in the outdoor

The CSE study also suggests that children in rural India are already exposed to high levels of cooking stove pollution in their households due to the high dependence on biomass-based fuels. The few hours that they spend daily in anganwadis and schools that serve mid-day meals should not add to that exposure. Replacement of these stoves with LPG (or other ICS) can help eliminate exposure levels. The evidence from this study would be an important base for policy makers across the country in designing policies to safeguard children from HAP..

While this may not be a highly profitable market for a manufacturer as the ecosystem of anganwadi procurement process is driven by government channels, it requires a huge intervention in clean cooking methodologies. After all, a scheme designed to protect

underprivileged children from malnutrition cannot continue to be the reason for causing respiratory disorders in the beneficiaries.



Children at an anganwadi in Bundelkhand, Uttar Pradesh

Image : SCF archives

Conclusions from the cookstove manufacturers surveyed

For the purpose of the report, SCF conducted interviews with four manufacturers:

1. TIDE & Sustaintech (Bangalore, Karnataka)
2. Greenway (Gujarat)
3. Envirofit (Aurangabad, Maharashtra)
4. Prakti (Puducherry)

3.1 Cookstove Manufacturer (TIDE and Sustaintech)

TIDE has been working in the community itchen sector for more than 15 years. 90% of work done by TIDE is in the community cooking sector. Their products are disseminated by a partner social enterprise, 'Sustaintech'.

The inspiration for TIDE comes from their understanding of traditional cooking practices in the region and from designing stove prototypes that effectively meet the requirements of the consumer while delivering maximum fuel efficiency. TIDE has developed stoves for a variety of cooking tasks and fuel types. Keeping pace with recent trends and needs it has introduced a new range of ultra clean, forced draft stoves that use sized agro residues as fuel. Their new force draft cookstoves run on pellets.

TIDE works directly with farmers who cultivate mulberry and with local pellet manufacturers in creating a supply chain for pellets in the region at an affordable cost. Pricing starts from Rs. 20,000 and goes up as per the requirement. The return on investment is about 6 months and the life of TIDE stoves is 6-8 years.

TIDE works in four segments:

1. **Sweet and Bakery Shop owners in semi urban, peri urban settlements -**
Small scale food processing units, roadside *dhabas*. These businesses are cost intensive and users generally make a shift from LPG based stoves to TIDE stoves. These establishments have recurring income which make it easier for them to afford a TIDE stove as the return on investment period is not more than six months.
2. **Religious/ non religious trust, shelter homes, destitute homes etc.** which are funded by organisations like Give India, Oxfam, WWF, Selco etc. through donations and funding programmes
3. **Mid day meal kitchens in Telangana, Karnataka and Tamil Nadu -**
These stoves act as alternate cooking solutions to LPG being provided to these centres.
4. **Capacity building of locals -**
There is another major sector of training locals in making Tide stoves as a livelihood. TIDE has been able to map these trainee entrepreneurs and provided them with livelihood opportunities in multiple states. TIDE usually goes with training the trainer model which is sustainable in the long run (for example, 70 percent cost sharing from a funding partner and 30 percent from the consumer which will act as trainer fee).

General takeaways:

- Pricing points should cater to customer requirements and return on investment should not be more than a year.
- Kitchens which are getting income on a daily basis (bakeries, restaurants, food processing units etc) have shown interest in TIDE's solutions.
- Grant based projects in community cooking are very crucial.

3.2 Cookstove Manufacturer (Greenway Grameen)

Greenway is one of the largest manufacturers of ICS in India and has been able to customize the cost of cookstoves as per the user's advantage.

As per Ankit, CoFounder, Greenway, “there is a lack of standardization in the community cooking sector in India. From a techno-commercial standpoint, community cooking stoves are difficult to scale up as handholding is required to operate the stoves which is not the case in any other improved stove. “

The respondent cited the following barriers in the context of community cookstoves:

1. Community cookstove has to be at a **standard height** to make it convenient to cook while standing.
2. **Controlling** the flame. High flames will require proper insulation for safety of the cook.
3. Manufacturers are **not technically equipped** to make community cookstoves at a scale.

As per the respondent, community cooking should not be looked at from a solution perspective as the size of the problem is not defined. For example, there is no classification of *dhabas*/community kitchens on the basis of fuel used and cost involved. If there is a classification it can lead to a strong business case.

Despite being one of the leading players in the clean cooking sector, Greenway decided to roll back its community cookstove solutions as there is no clear assessment of the need gap. In addition, they would like to keep their focus on the household market as their current manufacturing set up is equipped to fulfill this particular offering.

More information about Greenway can be found on the following links:

<https://www.youtube.com/watch?v=HO7Edb4pazM>

<https://www.youtube.com/watch?v=HO7Edb4pazM>

3.3 Envirofit

Based in Aurangabad, Maharashtra, Envirofit is one of the biggest players in the cookstove industry and has multiple offerings in the community cookstove segment. It has an established international manufacturing network and markets and comes with a strong experience in India as well. Like most manufacturers, their major focus is towards a HH solution, but their product range includes a handful of community cookstoves.

Through our conversation with the CEO, we understood that their most successful consumer base has been the road side *dhabas* and restaurants as they can see an immediate impact on

savings through fire wood. As per their experience, once these *dhabas* and restaurants start to use the Envirofit stove, they reduce their dependencies on LPG because they block their money on LPG, whereas on wood they can pay as per requirement. This consumer base is not so concerned about the smoke aspect and is known to be price sensitive.

Although they are not catering to the other user base like the hostels and anganwadis due to complexities in the funding model, they have some experience in supplying stoves to a relief kitchen in Nepal after the earthquake in 2015. The project was funded by an international humanitarian organisation who was running the kitchens. Their stoves received good feedback in terms of usability as it was an easy plug and play model.



Envirofit Community stove in Kenya
Image from the internet

3.4 Prakti

Based in Puducherry, India, Prakti started out as a manufacturer of community cookstoves for large weddings and such events. Their mandate was to develop products that replaced brick-based cookstoves. However, since they could not crack the distribution model of community cookstoves, Prakti switched to the household cookstove segment and scaled up their business from there.

Prakti cookstoves use natural draft technology and offer three types of cookstoves that are based on pot sizes - 40L, 80L and 240L. These stoves work on both types of fuels, wood and animal dung. Through our interview with a representative from Prakti, we garnered valuable insights on the community cookstove category.

Shortage of buyers willing to make an instant purchase

It is difficult to find buyers of community cookstoves who are willing to make an instant purchase. These stoves demand a greater amount of demonstrations depending on which the individual is willing to make the purchase.

Restrictions on firewood leading to increase in demand for fuel efficient stoves

Prakti ran a pilot in Kanha tiger reserve, where there was a good uptake of ICS despite the fact that the community had access to abundant firewood for use as fuel. Regulations on firewood collection have become stringent in the region, which subsequently created a demand for fuel efficient stoves for cooking 'mega meals'.

Region-specific cooking styles require product design tweaks

In South India, where gatherings and outdoor events are common, makeshift kitchens are seen abundantly. However, meals here are prepared in a specific manner and the stove design does not necessarily suit the requirement of the cooks. For example, the local preference for cooking a pot of biryani is that the pot needs to be covered with half-burnt wood for a certain period of time, while the dish is cooking. This is a highly specific necessity and is not available in stoves offered by Prakti, according to our respondent.



Image shows a development process at Prakti R&D centre
Image from internet

Challenges and opportunities for manufacturers

1. **Ensuring solutions are affordable, accessible and reliable:** Stable supply of affordable clean fuels and energy sources are essential for consumers to consider a shift from polluting fuels. An impediment to this shift is the absence of an enabling environment that allows access to cleaner options and supply of safer alternatives by manufacturers.
2. **Tackling the deep-rooted cultural patterns** that guide preference and practice of traditional cooking technologies and fuels
3. **Procuring funding** and grants for scaling up projects.
4. **Insufficient testing, certification and monitoring** facilities - this impedes research and development which in turn does not allow the scaling up.
5. **Developing local production capacity** in order to strengthen awareness about the product, facilitate training on operating the model and finally, enhancing adoption

6. **Developing products that suit the specific requirements** of the community.
7. **Challenges in setting up a supply chain** - affordability of fuel, ease of procuring fuel and ease of maintenance are key reasons for users to opt for traditional methods of cooking. The absence of a deep rooted supply chain for innovative or improved cooking methods push people back towards their trusted and highly polluting option.

In view of these challenges, the strategic approach for the product roadmap of HRS should include the following aspects:

- (i) Technical,
- (ii) Cultural & social,
- (iii) Distribution channels,
- (iv) Pricing and,
- (iv) Marketing and communications

Recommended strategic approach for HRS

This section proposes recommendations for HRS in the development of its prototype for ICS for community kitchens. These suggestions address product design, technology and supply chain related matters.

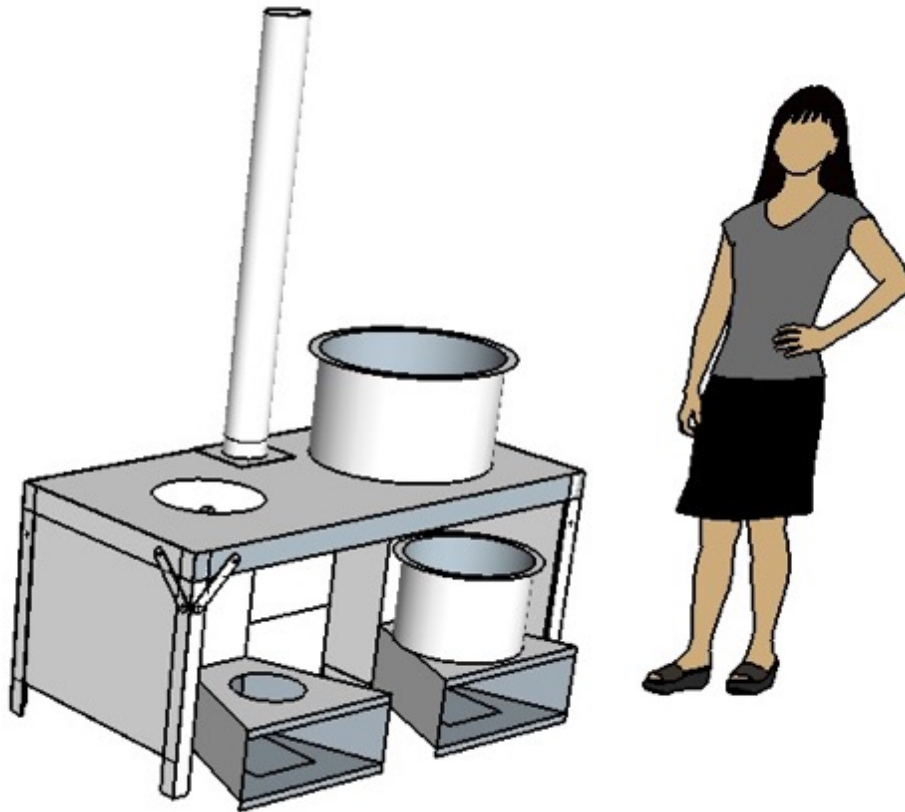
1. **The cookstove should be designed with larger feeder mouths.** Our study suggests that the users of community cookstoves are dissatisfied with the size of the feeder where the fuel is fed from. The community does not want to waste time in chopping wood to cater to a smaller feeder mouth. This problem is exaggerated for a community cookstove as it needs to cater to faster cooking and quick turnaround.
2. **Provide a wholesome kit and innovative, relevant solutions** to make adoption easier. This includes a proper lighting kit, fuel options like pellets and if possible, a cookstove available as a combined solution. To address the reality of stove stacking, it would be a good idea to provide a solution that allows for mixed fuel options in running the stove.
3. **Ease of use.** One of the most crucial insights gained through this research has been the time factor governing this segment. Almost all of the target user groups are operating on a tight schedule for the meal plan. Hence the cookstove should be extremely easy and quick to use without much maintenance required.

4. **Development and field testing of improved cookstoves with two burners.** While some reports suggest that the preference is for cooking one item at a time, the users of cookstoves are open to saving time by using stoves with 2 burners. A report by GIZ on the subject states that users who typically use 2 burners on their traditional chulhas were of the opinion that ICS models with only one burner were not a good replacement for their two-burner traditional stoves. In community kitchens where the quantity of people catered to is much higher, a 2-burner model would be beneficial. HRS should develop and introduce new two burner ICS models to cater for this demand.
5. **ICS should be designed with bigger combustion chambers.** Stove users are often worried about the ash and fuel residue filling up inside the combustion chambers of their stove. This implies repeat and frequent cleaning and subsequently, switching to secondary and tertiary cookstoves which would be of inferior quality. But introducing larger chambers, HRS could potentially prolong the use of its ICS at these kitchens.
6. **Pricing.** While it is understood that this is a price sensitive market, our research indicates that most community cookstoves are within the range of Rs 20,000 and goes upto Rs 65,000 depending on pot size and capacity to cook. However, there is no indication as to which one is the most successful model with a high adoption ratio. On their pricing strategy, Prakti said in an interview with The Better India, “We always try to get NGOs and SHGs on board that can subsidise the price of the stoves.”
7. **HRS should focus on developing a model targeting regions where firewood is abundantly available** rather than one that suits generic needs. The study established preferences for ICS models varied as per their requirements, fuel use and individual taste - factors that vastly vary as you move across the length and breadth of the country. Rather than spreading itself too thin, it is recommended that HRS caters to an audience that is best suited to its core product design.
8. **Distribution approach.** In the initial period, HRS should aim to keep its market concentrated in a small region and hence work with key players in the ecosystem of that region. These could include distributors, local government; NGOs, local bodies driving procurement processes of educational establishments like anganwadis and hostels. In order to target local *dhabas* and restaurants, product demonstrations would hold great importance. This could be the only segment that could be targeted directly as they fall into any nexus or an organised system.

Alternatively, HRS can also partner with any of the state governments (Bihar, Jharkhand, Kerala, Madhya Pradesh and Odisha) or their Gram Panchayat where *Didi's* cafes have been set up. This engagement could be a pilot run for HRS and a good way for the manufacturer to entrench itself into the state machinery for food security.

9. **Awareness and operational training to enhance stove adoption.** The research informs us that even though the users of cookstoves are aware of the health impacts of cooking on traditional cookstoves, they do not actively look for alternatives. Neither are they willing to use a safer alternative because often, fuel is inexpensively (and frequently, free of cost) available. By using influential community members at the village level and local health workers to promote the messages of safer cookstoves and to assist in product demonstrations, the adoption of new stoves could be enhanced. It would be a good idea to use proven methods of behavioral sciences to design these messages and interventions.
10. **Simple and easy to comprehend training aids** to efficiently use the HRS Cookstove. Based on the experience gained from HRS' heating devices, it will be crucial to develop video based manuals for the user to easily understand the workings of the stove.
11. **Strengthening the clean cookstoves ecosystem.** The sector is currently very disorganised. Government programmes do not cater to community kitchens of anganwadis, tribal hostels, *dhabas* and small hotels, relief camps as much as they ought to. As a result, there is low awareness, low demand and low adoption of ICS. Even though there have been prototypes to suit the needs of these categories of users, they have been recalled from production because of poor uptake. Community cooking should not be looked at from a solution perspective as the size of the problem is not defined.

In some cases, such as *dhabas/* community kitchens, there is no classification on the basis of fuel used and costs involved. If there is a classification it can lead to a strong business case. By leading from the front and pulling together key players in the ecosystem of ICS for community kitchens, HRS can help push for increased testing, standardisation and subsidies for cookstoves in this category.
12. **Generic name to enhance pan-India appeal.** Given the vast difference in cooking styles, tastes and fuel preferences and the strong sense of 'regional pride', it is recommended that HRS tweaks its name when it decides to go pan-India for the new product line - one that is more inclusive and generic. For ex. Rocket Chulha



Design sketch from HRS for illustration purpose only

Roadmap for field trials

Field trial phase for HRS' community cookstove solution needs to be designed keeping the following aspects in mind:

- The product has application in diverse locations and hence the trials should be conducted at least 3 different settings/ locations.
- A trial period budget needs to be set aside as the stoves will need to be donated.
- Product application will require training aids for complete adaptability and the trial period can act as a efficacy test for the training aids as well.

- Minimum monitoring period should be 6 to 8 weeks to establish an understanding of the product usage.
- Final product feedback process can be completed within three months from the start of the product trial phase.
- There could be some feedback on the original design based on user feedback which HRS should be prepared to take on board
- Safety aspects of the stove usage should also form a key component of monitoring and documenting the usage experience

S.No	Location / setting	Region	Monitoring frequency
1	Dhaba/ local restaurant	Close to HRS manufacturing unit - Baddi	Weekly
2	Religious establishment like a gurdwara or temple	Close to a team member's place of stay - Himachal Pradesh	Weekly
3	<i>Anganwadi/ Didi's Cafe</i>	Maharashtra/ Madhya Pradesh	Fortnightly
4	Community kitchen	Maharashtra	Weekly
5	Tribal Hostel	Gujarat	Fortnightly

- Based on the above field trial plan, SCF team will develop
 - Baseline indicators,
 - Monitoring parameters,
 - Feedback loop with HRS team,
 - Impact evaluation study
 - Final report with recommendations from the users

Annexure

A) Questionnaire for manufacturers

1. Where is your manufacturing based out of?
2. Where is your consumer base?
3. Who is your primary customer? More in the commercial space where they can sell the stoves
 - a. Low income
 - b. Mid income
 - c. Marginalised communities
 - d. Rural communities
 - e. Urban communities
 - f. Any other?
4. Do you have a community chulha as a product offering?
5. If yes, what is the capacity of this chulha? What is the maximum number of people it can cook for? (If No, refer to question 13)
 - a. 25 people
 - b. 50 people
 - c. 100 people
 - d. More than 150 people
6. What is the technology used?
7. What type of fuel is being used?
8. What is the MRP?
9. Who is your primary customer?
 - a. schools/ *anganwadis*
 - b. Community kitchens
 - c. Hostels
 - d. *Dhabas* & Mess
 - e. Kitchens of Industrial establishment
 - f. Resorts and hotels
 - g. Weddings, fairs and melas
 - h. Any other?
10. Where do you find the maximum success in selling these stoves from above?
11. Is there a social purpose attached? Through CSR or grants or sponsorships by benefactors?

12. Have you been able to give these stoves to any of the temporary kitchens catering to migrant communities? If yes, please share your experience in terms of supply chain, usability, costs etc.? If No, have got any requests?
13. Are you aware of any issues related to cooking in these migrant kitchens? These issues could be related to
 - a. Fuel availability
 - b. Smoke
 - c. Costs
 - d. Capacity
 - e. Availability
 - f. Any other
14. If you don't have a community cookstove, do you plan to develop one?
15. Do you think that issues related to the community cooking scenario in India is as serious as that of Household level issues?

B) Questionnaire for community chulah users

Physical assets:

1. Is your kitchen housed in a permanent structure?
2. If you do not have a permanent structure, where do you operate?
3. Is your work space adequate?
4. What improvements would you like in your work space?
 - Construction of permanent structure
 - Expansion/improvement of existing structure
 - Provision of power source
 - Assistance to procure material
5. Is your organisation a beneficiary of any of these?
 - Private company
 - Local government group
 - Religious charitable trust
 - International foundation
 - Other groups not mentioned already

People

6. How many personnel do you have working in the kitchen?
7. How many of these are women?
8. Is there a difference in the tasks assigned to men and women?
9. How many meals are prepared in a day?

10. How many people are fed in one day?

Stove use

11. What kind of cookstove do you use?
12. Does the smoke from your cookstove bother you?
13. Do you use more than one type of cookstove?
14. If yes, which are the different types of cookstoves used by you? Is one of them an LPG-cylinder run cookstove?
15. If using LPG cylinders, are the number of cylinders that are given to you sufficient for your cooking needs?
16. Who typically collects fuel in this establishment?
17. How frequently do you purchase fuel?
18. What is your per day consumption of fuel (in Kgs)?
19. How much does the fuel used in your cookstove cost you per day/ month?
20. Do you consider this amount to be affordable?
21. What is your source of funds?
22. Are you covered under any government scheme to support the procurement of fuel?
23. Are you satisfied with this scheme?

Single cooking device – if mud stove:

24. What is the source of fuel?
25. Is the fuel for your cookstove easily available?
26. Where do you procure your fuel from?
27. What is the total cooking duration per day on your cookstove?

Primary cooking device

28. Is the fuel for your cookstove easily available?
29. What is the total cooking duration per day on your cookstove?
30. How many days per week do you use this stove?
31. How many meals per day do you cook on this stove? Alternately, how many people do you feed using this stove?
32. How many of these stoves are simultaneously used in your kitchen?
33. What do you like the most about this cookstove?
34. If any, what is the biggest challenge you experience with this cookstove?
35. How long ago did you acquire this stove?
36. Did you purchase, receive or build this cookstove?
 - Purchased
 - Self-built

- Received as a gift from family
 - Received as a donation from an NGO
 - Received from the government
37. What was the cost of building/ purchasing this stove?
 38. Have you ever repaired this stove?
 39. Did you do this yourself? If no, who did it for you?
 40. If yes, when was the last repair done?
 41. How much did it cost you?
 42. Have you modified the stove in any way to suit your dietary needs and cooking style?
 43. If yes, what did you change and why?

Secondary cooking device

44. What type is your secondary stove?
45. How many days per week do you use this 2nd stove?
46. On the days it is used, how many meals per day do cook on it?
47. When did you purchase/receive/build this stove?
48. What do you like the most about this cookstove?
49. If any, what is the biggest challenge you experience with this cookstove?

Aspirational cookstoves

50. Have you heard of any modern cookstoves? Can you list the types that you know of?
51. Are improved cook stoves available for sale in your community?
52. Would you ever like to switch to a more modern cookstove? If not, why?
53. Which type of modern cook stove would you like to use?
54. What according to you makes a good cook stove? Don't give the respondent these options. Basis their response, tick the appropriate boxes.
 - Saves fuel
 - Less smoke
 - Easier to light
 - Fuel available more easily
 - Cooks faster
 - Looks attractive
 - Other:

Health and Safety

55. Are you aware of the impact of smoke from indoor chulhas on the health of women and children?

56. Have you been a recipient of any health awareness programmes which educate you about these impacts?
57. Have you suffered any burns when cooking with the cookstove in the last 6 months?
58. If yes, how many times have you been burnt when cooking in the last 6 months?
59. How severe was the most severe burn during this period?
60. How did this burn occur?
61. Do you frequently experience any of these symptoms?
 - Coughing
 - Watering of eyes
 - Breathing issues
 - Back and neck ache
 - Heat sensation on skin/ Skin allergies/ discomfort



Smokeless Cookstove Foundation, (SCF) is a 100% non-profit venture Licensed under section 8 (1) of the Companies Act, 2013; SCF has received 12AA and 80G . (Donation to Smokeless Cookstove Foundation is exempt as per the provisions of Section 80 G of The Income Tax Act, 1961 vide Certificate No. CIT(E)/80G/2997/2019-20 dated 28th May, 2019 valid from A.Y. 2019-2020 onwards until rescinded.)

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