7 Energising change

Clean cooking and the changing social position of women

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Introduction

India is undergoing a clean cooking revolution and the recent flagship programme of the government – the Pradhan Mantri Ujjwala Yojana (PMUY), launched in the year 2016 – is a testament to it.¹ The programme is laudable for its unique approach, design and implementation strategy and has succeeded in distributing more than 80 million subsidised liquefied petroleum gas (LPG) connections to women from underprivileged households.² This clean cooking initiative is pertinent to prioritise the urgency of achieving the goal of universal access to clean cooking solutions by 2030, a subset of the Sustainable Energy for All (SE4All) initiative,³ more so since nearly 688 million people in India still lack access to clean cooking (IEA, 2018).

PMUY, however, is not entirely bereft of challenges. Affordability of refills, behavioural patterns in cooking choices and issues with supply chain and access are some of the barriers that have affected the performance of PMUY as a programme (CAG, 2019). In addition, the presence of easily available subsidised kerosene to BPL⁴ families has a limiting effect on the use of LPG (Swain & Mishra, 2020). Studies have indicated that the share of total LPG consumers who use LPG as their primary cooking fuel is about 60%, and it has largely remained unchanged since 2011 (IIPS and ICF, 2017). Smith (2017) estimates that even if LPG penetrates 90% of the population by the next decade, there would still be a sizeable population relying on inefficient traditional cook stoves. Moreover, traditional stoves using solid fuels remain the primary choice for rural consumers due to their affordability and easy access (Banerjee, 2019). These arguments, thus, build the case for the promotion of energy-efficient improved cook stoves. Moreover, clean cook stoves present opportunities for women to be gainfully employed as entrepreneurs and providers of energy supply and services. This is bound to further encourage gender equality in employment and improve the effectiveness of the value chain, thus correspondingly contributing to achieving the SDG goals (5 and 7).

With this logic and a mission to develop and disseminate technological interventions that would also help address social issues, Technology Informatics and Design Endeavour (TIDE), a civil society organisation from Karnataka, India,

entered the area of clean cooking and started various development programmes. Their flagship programme provides clean cooking technology and capacity building to rural women. Women are engaged through entrepreneurial-based empowerment training to take up responsibilities as cook stove builders, thus opening livelihood opportunities for them.

Their efforts have thereby contributed to scaling up the number of women energy entrepreneurs throughout the clean cooking value chain, along with testing innovative implementation approaches and building evidence to inform policy and practice about successful gender-inclusive business models. Several research agencies have documented TIDE's work in the field of clean cooking. A study by (Lockhart, 2013) provides a comprehensive assessment of TIDE's model in terms of creating green social entrepreneurship that provided alternate economic opportunities to women, and created space for environmental and health awareness, actuating improvements in women's social position. The One World Foundation India (2011) has also documented the various aspects of TIDE's model, technology, capacity building, financial and dissemination models and impacts on the ground. Further, the impact of TIDE's collaborative work with WWF India, wherein trained women cook stove builders constructed more than 300 Sarala stoves in 14 villages of Gundri and Makkampalayam, saw an almost 35% reduction in fuel wood usage and reduced smoke in the kitchens (WWF, 2018). On the other hand, Selco Foundation's evaluation of the Sarala stoves revealed that unless proper maintenance is done, the stoves do not retain the expected efficiency (Selco Foundation, 2017).

A number of studies have also highlighted the importance of having women as a key part of the distribution model (World Bank, 2011; Smith & Dutta, 2011; Köhlin et al., 2011), since they can leverage their existing networks to promote the adoption and use of new technologies, especially those related to cooking. Besides, projects in which women-targeted approaches were followed and women were included in the supply side of the value chain, often resulted in empowerment (Bolton, 2015). For example, among the participants of an entrepreneurship training project in Kenya, women sold almost three times as many new cook stoves as men (Shankar et al., 2015a). The increased women's capacity to engage effectively within the improved cook stove value chain served as an effective means to facilitate entrepreneurial empowerment. Increasing women's engagement in the energy business model may have additional benefits for the family and community. It is estimated that women reinvest nearly 90% of their income back into their families' education, health and nutrition as compared with 35% for men (Borges, 2007).

There are several studies that have argued for the inclusion of women in the value chain, from product development to sales (Price, 2019; Gill et al., 2015; Pearl-Martinez, 2014; Shell Foundation, 2020), which also add value to the emerging energy justice debate. Energy justice scholarship, which addresses inequalities in energy production, distribution and consumption has expanded beyond a focus on fuel poverty. Developed as both an analytical and practical decision-making concept by Hall et al. (2013), the popular framework proposed

by Sovacool et al. (2016) calls for ensuring balance of all the competing aims and trade-offs in the energy sector to be inherently more just and equitable in their societal outcomes rather than favouring different factions within society. Though the inclusion of gender in energy justice is not explicit in the framework, it resonates with its core idea in terms of equitable sharing of outcomes, which involves social and gender inclusion at every step of the energy value chain.

The specific case of TIDE, which recognises the urgency of switching to clean cooking while also providing entrepreneurship opportunities for women, warrants further focused analysis, to understand the realisation of justice goals in contemporary social formations. Moreover, understanding the deeper issues of evolving social positions of women, deeply embedded in the overlapping dynamics of local cultural practices, are also important for achieving comprehensive justice objectives.

Understanding the context

TIDE technology

Over the years, several clean cooking programmes have been launched globally and in India, such as LPG deployment (from the 1970s), the National Biogas and Manure Management Programme (1981), the National Programme on Improved Cook stoves (1986), supply of piped natural gas (since 2014), the Unnat Chulha Abhiyan (2014), the Pradhan Mantri Ujjwala Yojana (2017) and even the constitution of the Global Alliance on Clean Cook stoves in 2010 (CEEW, 2017; Clean Cooking Alliance, n.d.). TIDE also recognised the urgency of switching to clean cooking and came up with its own smokeless cook stove design, known as the Sarala stove, in 2002.

The Sarala stove is a natural draft, front feeding, two-pan mud stove with a chimney that uses any agro-residue as feed (see Figure 7.1). It was developed by the Indian Institute of Science (IISc), Bangalore as a simplification of its predecessor – the ASTRA stove (Bhogle, 2003). The total cost of the stove, including charges of the stove builder (INR⁵ 200 or USD 2.73), amounts to around INR 1,000 (USD 13.63), which is borne in part by TIDE (70%) and in part by the household (30%) who make in-kind contributions of mud and bricks.

TIDE, upon successful completion of training, provides women cook stove builders a mould to build the stoves on-site, comprising cast iron components like a grate, fuel feeding guiding frame, and support rods. The smoke arising from the stove during cooking is let out from the stove to outside the house through a cement or galvanised iron (GI) pipe, which serves as the chimney. Every three months, the chimney needs to be cleared of accumulated soot. With regular maintenance the stove can comfortably last around 8–10 years.

TIDE's activities are mostly focused around the Indian state of Karnataka, which is one of the most prosperous states of India and was ranked second in terms of per capita income in the year 2017–2018 (Government of Karnataka, 2019). The Sarala stove programme was initiated and is concentrated in Tumakuru

Figure 7.1 Cook stove mould (left), finished mud stove (right). Source: Authors' field photographs.

district of the state. Before the programme was designed, the challenges of uptake in the community, the demand factors and the potential areas for economic growth in the community were investigated, all with a gendered lens.

Most scholarly work on women's entrepreneurship in the cooking domain has emphasised on the importance of context in relation to socio-economic factors, cultural sensitivities and intra-household dynamics amongst other things (Cecelski, 1995; IRADE, 2009; Practical Action, 2014). Studies have also indicated that with education, training and investment, women can build businesses or be employed in the design, production, marketing, sale and maintenance sectors of new energy technologies and services (Shankar et al., 2015a; APEC, 2019).

In the wake of the energy justice movement, TIDE's activities have become more relevant since prominence is given to the involvement of women belonging to disadvantaged social groups like Scheduled Caste (SC) and Scheduled Tribes (ST), along with women belonging to the more advantaged groups like upper castes in aspects of development, marketing and dissemination of their technologies. In the Indian context, it resonates with Jenkins, McCauley & Forman's (2017) idea of dovetailing energy justice and policymaking to manage the translation of universally accepted values into real life.

The modernity of caste and gender

Indian society is based on the hierarchy of social order of caste system and the explanations of caste in contemporary India are both complex and often conflicting. Caste, which is commonly known as "*Jati*"⁶ is a form of hierarchical social stratification characterised by hereditary transmission of a lifestyle that often includes an occupation, food patterns, ritual status and customary social interaction and exclusion based on cultural notions of purity and impurity. Some

scholars have analysed caste in terms of three key effects: social separation, graded status, and occupational specialisation (Dumont, 1980), while others have raised the *ideological* dimension associated for example with ideas of purity and impurity, ritual ranking or the moral-bodily constitution of human difference and interaction (Dumont, 1980). In examining the various issues of stratification, many historians and social anthropologists point to the British colonial period as a key turning point in changing caste sentiment among Indians (Riser-Kositsky, 2009). The British transformed caste from a loose, discriminatory hierarchy into an officially structured and state-sanctioned hierarchy. In modern Indian society, castes are officially classified into four administrative categories (as per the Indian Constitution) – Scheduled Caste (SC) and Scheduled Tribes (ST) ranked as the lowest, Other Backward Classes (OBC) is a collection of low to middle ranking castes and the General Category/Open category denotes the upper castes.

In India, gender as a marker of disparity is pervasive and the literature analysing gender disparity is huge. Disparities based on gender in education among girls, especially in terms of school enrolment, in India has also been examined extensively in literature (Bandyopadhyay & Subrahmanian, 2008; Desai, 2007). Financial inclusion for women and their credit worthiness is another crucial domain where gender gaps are glaring (Khera, 2018; Ghosh & Vinod, 2017; Chatterjee et al., 2019). Studies have shown gender to be a discriminating factor when it comes to decisions regarding access to healthcare services and financing in India (Kapoor et al., 2019; Moradhvaj & Saikia, 2019; Saikia et al., 2016; Rajeshwari, 1996). Women and girls are also disproportionately and adversely affected by environmental degradation, as research suggests (Agarwal, 1992; Agarwal, 1997). Furthermore, India is ranked low among the medium human development nations of the world in the Gender Development Index, with a score of 0.829, placed in group 5, which is also indicative of ingrained gender disparities in the Indian socio-economic development context.⁷

Given the multifaceted nature of disparity in India, both gender and caste continue to be important indicators of intergroup disparity. These kinds of disparities limit opportunities, especially for lower castes such as SC/ST and women (Murthi, et al., 1995; Jeffrey & Basu, 1996). In an assessment of gender–caste overlap, Deshpande (2002) observed that the economic condition of women continues to be defined and constrained by their caste status. Lower-caste women are also worse off than upper-caste women in terms of in terms of standard of living, prevalence of domestic violence, suggesting that caste and gender intersect in increasing or decreasing women's vulnerability. The Gender Caste Development Index (GCDI) for India clearly identifies that SCs lag behind OBCs, who, in turn, lag behind the upper-caste women for most of India (Rao et al., 2007).

At the same time, there has been the traditional distinction between lower-caste and upper-caste women based on the relative egalitarianism and greater freedom of movement of the former. The lower-caste women are seen to have lower taboos on public visibility, greater autonomy to seek gainful employment outside their homes and communities and a higher degree of mobility compared to their upper-caste counterparts (Deshpande, 2002). In a bid to acquire status mobility,

the ever-increasing emulation of upper-caste practices or “*sanskritisation*”⁸ by the lower caste can also produce widening caste and gender divides. The lower-caste men, while displacing ignominious obligations of caste hierarchies, also tend to impose new restrictions on women’s autonomy and mobility which again exemplifies how caste interlocks with gender inequality (Still, 2017). Scholars have examined women’s collective honour or dignity, a notion that can be measured by the degree of respect shown by others. The failure to maintain the traits of dignity can bring dishonour to the family and sully the purity of their caste (Kabeer, 2000).

To address some of the historical disadvantages and deep-rooted caste inequities and discrimination, India has had a long-standing policy of affirmative action to honour the Indian Constitution, which enshrined a commitment to equality in its directive principles. Fixed quotas or “reservations” were constitutionally mandated for the most socio-economically disadvantaged sections of society (SC/ST) in all public sector employment, seats in higher educational institutions, and elected positions. These quotas were further extended to OBCs and the most recent 124th Amendment Bill 2019 seeks to provide for the advancement of “economically weaker sections”, through 10% reservation in government jobs and higher educational institutions – a shift in focus from caste as basis of quotas (The Economic Times, 2019⁹). National Commissions have been set up for SCs and STs and there are various economic schemes announced from time to time creating employment or granting welfare payments or other benefits to the socially disadvantaged.

Various government programmes and schemes have also been launched to provide equal opportunities for women. Beti Bachao Beti Padhao, Mahila-e-Haat, Mahila Shakti Kendra, Support to Training and Employment Programme for Women (STEP) and Pradhan Mantri Ujjwala Yojana (PMUY) among others are programmes and initiatives devised towards empowering the women of India (Ministry of Women and Child Development, n.d.). In addition, specialised schemes have been formulated for the economic upliftment of women belonging to lower or backward castes. The New Swarnima loan scheme and the Mahila Samridhi Yojana for SC and OBC women by the Ministry of Social Justice and Empowerment, Scheme for strengthening education among ST girls in low literacy districts by the Ministry of Tribal Affairs, and specific provisions under the Mahila Coir Yojana of the Coir Board are among many schemes targeting women of SC/ST/OBC communities (Ministry of Social Justice and Empowerment, n.d.; Ministry of Tribal Affairs, n.d.; Coir Board, 2014).

However, it is also often argued that these affirmative actions have contributed to an increased caste consciousness and resulted in the continuance of caste influence in contemporary Indian society (Mosse, 2018; Jayal, 2014; Jodhka & Manor, 2017; Munshi, 2017). Few studies examining the effect of political reservations for SC, ST and women candidates indicated a reduction in incidence, and to some extent intensity, of poverty among SC, ST and women, as well as among low-income communities in general (Kaletski, Elizabeth; Prakash, Nishith, 2016) (Chin & Prakash, 2010). Various studies have also documented the challenges of affirmative actions in terms of achieving positive socio-economic and cultural outcomes. Jaffrelot (2006) has noted that the quotas for higher status civil service posts were

not filled in any significant way until the 1980s. While this situation has certainly improved, a more recent study by Bhojani, et al., (2019) describes the limited direct impact of affirmative action, especially in the case of quotas in government jobs, possibly because of poor implementation. Deshpande & Yadav (2006) have also argued that caste and gender closely intersect in defining outcomes of the reservation. For instance, their analysis finds that in higher education, even within each caste, those in higher economic classes do better as compared to lower classes, with women lagging in both low economic class and caste groups. Common criticism of the affirmative actions and social policy has been the argument of treating caste as a static or residual problem addressed through remedial provisions, safeguards like quotas/reservations and complaint handling, rather than as a dynamic relational problem that the state is generally bound to address (Mosse, 2018).

There has also been a large volume of scholarly work and journalistic commentary that is devoted to questioning whether the old caste hierarchies are valid any more since the Indian economy is increasingly becoming market-oriented and globally integrated and the castes do not necessarily follow a linear hierarchy (Kapur et al., 2010; Damodaran, 2008; Banerjee et al., 2009; Chandrashekhar & Ghosh, 2014). Caste-based hereditary occupational linkages are no longer rigid and have become flexible enough for people to opt out of their family and caste occupations to pursue better caste-free opportunities like agriculture, industry or white-collared jobs. However, even today, to a larger extent, certain castes do not have freedom to get into the domain which is the specialty of a particular caste. For instance, priestly duties and officiating ceremonies and weddings are still traditionally limited to upper-caste men (*Brahmins*). Scholars have aptly noted that breakdown of barriers is evident between “adjacent” castes rather than between castes at the extreme of the hierarchy (Mosse, 2018). (Karanth, 1996) argues that caste-based hereditary occupations and social mobility in the rural areas also led to “dual culture”, where there is adherence to traditional values in one context and modern and egalitarian ones in another.

Objectives

The present chapter attempts to examine some of the fundamental questions related to clean cooking and the changing social position of women: how does the involvement of women in the clean cooking supply chain affect gender equality through the distribution of benefits for women and men? And does economic autonomy of women entrepreneurs aid in changing social positions and gender relations within the household and beyond?

Approach and methodology

It is often argued that qualitative methods are more appropriate for studies related to gender since it aids the researchers to capture the description given by men and women in the context of the positions they occupy in everyday life (Maldonado, et al., 2013). To gauge the impacts of a women-centric design of energy interventions

on the changing social position of women, the study employed key informant interviews and focus group discussions (FGDs), which are considered a valuable tool for collecting rich qualitative data, and have proven to be effective and appropriate in understanding the views of women, in particular as it allows them to speak more openly among their peers. Further, this approach gives researchers an opportunity to understand the space better, considering multiple viewpoints. Hence, FGDs were used as a “self-contained” method rather than in combination with other methods like surveys that seek quantitative data.¹⁰ The essence of the qualitative data was retained by using verbatim quotes representing common viewpoints wherever applicable.

The study was undertaken in two villages of Tumakuru district in Karnataka – Shivasandra in Gubbi taluk and Kollihatti in Tiptur taluk (see Figure 7.2).¹¹ These villages were selected in consultation with TIDE and local leaders (both men and women) and were primarily based on the dissemination and uptake of cook stoves and the entrepreneurial training received by women. TIDE has trained around 200 women in Tumakuru district, mostly in the selected taluks. Around 25 women cook stove builders are very active. In Kollihatti village alone around 25 women have been trained by TIDE, of whom 16 are presently active. Some of them, like Kathyayini, have graduated to becoming master trainers, and have trained hundreds of women in Karnataka and other states.

Separate FGDs were conducted with one group of men and women from each village and the segregation was done to understand gender perceptions better and to avoid influence of perception of one on the other. Key informant interviews were conducted with women entrepreneurs and project implementers from TIDE. Specific checklists covering relevance of cook stoves in the current context, empowerment-based entrepreneurial training, financial autonomy, increased agency in terms of making decisions, and the challenges and opportunities of being cook stove entrepreneurs were used. Participation in the discussions was entirely voluntary, and prior consent was taken from the participants, who were informed about the purpose and nature of the research and format of interviews.

The study was supported by Climate Technology Centre and Network (CTCN),¹² hosted jointly by the United Nations Environment Programme (UNEP) and the United Nations Industrial Development Organization (UNIDO), as part of a larger study undertaken in India and Nepal to assess the efforts to incorporate women into the value chain, specifically in the clean energy sector. Cases in the domain of grid and off-grid electrification and clean cooking were selected based on pre-determined criteria like the level of gender inclusion in different stages of the energy project cycle, namely conceptualisation, formulation, implementation and monitoring and evaluation.

Results and discussion

Shivasandra and Kollihatti are two of the several villages in rural Tumakuru that still depend on inefficient and polluting stoves to meet their primary cooking requirements. This is despite the fact that more than three million LPG

KARNATAKA ADMINISTRATIVE DIVISIONS 2011

Figure 7.2 Map of Karnataka with administrative divisions.

connections have been released in Karnataka (till July 2019) under the Ujjwala scheme (PMUY, 2019). This is in part due to inability of the consumers to afford LPG refills, and due to traditional behavioural preferences for food cooked on traditional mud stoves. Agriculture and allied activities, which form the primary source of employment for the village community, were also the highest contributor to the district GDP in 2012–2013.¹³ The female workforce participation in rural areas of Tumakuru is notably high, at 44%, many of whom are cultivators and agricultural labourers. However, the relatively stagnant agriculture sector is facing declining prospects for stable and remunerative employment opportunities for both men and women. Even the per capita income of farmers cultivating high value flower crops formed only 53% of India's per capita income, while those growing food crops earned only 28% of India's per capita income (2012–2013). Off-farm employment also contributed significantly to the income of farmers in the district. Tumakuru's proximity to Bangalore (the state capital) also contributed to people looking towards non-farm employment having more economic prospects than the farm sector (Jamakhandi, 2014).

Tumakuru has an equal population of upper caste, who are socially and economically privileged, and do not qualify for most of the affirmative action schemes operated by the government of India, and lower castes and tribes which receive support from the government for their social and economic upliftment. Prominent castes of Tumakuru include *Lingayat* and *Vokkaligas*, Other Backward Classes (OBC) like *Golla*, *Kuruba*, *Thigala*, *Ediga*, *Uppara* and SC/ST like *Madiga* and *Holey*, which are also spread across the district.

Effects of entrepreneurial-based empowerment training

Although Tumakuru has actively been a part of PMUY, the recurring cost of LPG for low-income families was putting pressure on household budgets. An efficient stove that could be fuelled with cost-free available biomass was thus still attractive. For instance, the Gubbi taluk has the highest forest cover in the district and availability of biomass is of least concern. Hence the households chosen by TIDE for dissemination of Sarala stoves are the ones that are unable to afford LPG cylinders and the recurring costs of refills. Awareness campaigns were conducted in the villages to educate the community about the need to transition from polluting to clean cooking technologies. As Sarala stoves resemble traditional mud stoves, women did not have to make any behavioural changes in accepting them. Users sufficiently value the advantages of the improved stoves if it is an attractive well-engineered version of a traditional technology (Shrimali et al., 2011). Once 80% of the households of a village shifted to smokeless stoves, it got the tag of "Smokeless Village". Studies have also indicated that high-performing biomass stoves can be a transitional or interim solution even when infrastructure barriers prevent access to the cleanest options (WHO, IEA, GACC, UNDP, World Bank, 2018).

Moreover, TIDE has clearly recognised that achieving clean cooking solutions is not just dependent on dissemination of clean cook stoves but also through

the full inclusion of women through the entire value chain. Evidence also suggests that women can play a critical role in the promotion, sale and adoption of improved cook stoves due to their roles and experience as primary cooks in the household and leveraging their existing networks (Köhlin et al., 2011). In the recent past, there has been an expansion of efforts to use women entrepreneurs to market and distribute clean cooking solutions through women's advocacy groups and women's networks to increase distribution and sales (Global Alliance for Clean Cook stoves, 2011). Hence the programme engaged the most motivated women in the villages, irrespective of their socio-economic background, to become entrepreneurs in an in-depth training programme developing their confidence, product knowledge, and business skills, including stove building, sales, marketing, servicing and accounting. The training revolved around skill building with a strong focus on enhancing leadership qualities. It also sought time commitment from women to carry forward the entrepreneurial opportunities. Studies have also demonstrated that when trainings follow a focused approach like being agency-based, there is substantial increase in women's capacity and willingness to identify and pursue economic opportunities and build strong relationship skills (Shankar et al., 2015b).

In a bid to form progressive civility, women belonging to social groups like Scheduled Caste (*Madiga, Holey*) and Scheduled Tribes received training along with women belonging to the dominant *Lingayat* and *Vokkaliga* communities. In order to be able to induct women for training, continuous efforts at creating awareness were undertaken by TIDE. These efforts were successful in bringing women, across social strata, together for availing entrepreneurship and livelihood prospects. Caste-free association can be even otherwise noticed in the village, especially in public spheres such as participation in panchayat,¹⁴ MGNREGA¹⁵ and other development programmes. Successful trainees are provided moulds required for making the Sarala cook stoves. The cook stove entrepreneurs are then equipped to go from house to house for cook stove construction, and one stove builder can construct three to five stoves in a day. Experienced entrepreneurs have also become trainers and train other women to become entrepreneurs. The programme is now managed by a group of 15 women entrepreneurs, who handle everything from raw materials, construction, operation and maintenance and marketing, after the initial hand-holding by TIDE.

Training imparted to women cook stove builders has empowered them to position themselves to play a crucial role in increasing awareness and demand for clean cooking by leveraging women-to-women communication strategies. This kind of intervention has been particularly beneficial since studies have indicated that, at the entrepreneurial level, women's participation in the energy sector is constrained by many of the gender-specific challenges, notably access to credit and ownership of property and other assets (Baruah, 2015). This is in spite of an array of programmatic efforts that have been targeted at realising greater involvement of women in supply-side operations (Ramani & Heijndermans, 2003). Hence, this consignment model has lowered the barriers to entry, allowing women from economically underprivileged households to become cook

stove entrepreneurs. Other studies have also emphasised TIDE's model as a good example aimed at promoting entrepreneurial and livelihood opportunities for women (Global Alliance for Clean Cookstoves, 2013). Moreover, the imperative to engage women in energy entrepreneurship is especially great due to an essentialist belief that "household energy is a woman's concern" (Khamati-Njenga & Clancy, 2003, p. 38). Nevertheless, this initiative has tapped the aspirational quotient among the otherwise socially marginalised groups like SC/ST/OBC to break the shackles of hereditary and hierarchical principles of enforced occupational and labour identities and take up cook stove building as an income generating opportunity.

The programme proved to be effective in creating additional livelihood opportunities for successful women stove builders, who were otherwise constrained by insufficient income and the seasonal nature of agriculture. Financial autonomy made the women entrepreneurs less dependent on their husbands or other male members of the family for their material wellbeing. On average, women earned around 70 USD a month and were able to exercise more agency at an individual level where they could control the profits they made, but were also able to communicate, negotiate and participate in the mundane household responsibilities. They even influenced household decision making as a result of improved bargaining power. These findings from the study resonate with the findings of the study by Johns Hopkins University, Babson College and ICRW (2019) which clearly state that, at the household level, social norms may begin to shift as women are able to contribute to household earnings and are also able to negotiate with their partners and participate in household decision making (Johns Hopkins University, Babson College and ICRW, 2019). Moreover, the women did gain some respect within the household and their extended families due to engaging in roles that involved physically moving throughout the community and interacting with diverse community members. An extensive literature review conducted by ENERGIA found many examples where women's empowerment increased as a result of participation in energy projects (ENERGIA, 2006).

This kind of proactive initiative, which concentrated not only on skill building but also on the ability of women to pursue entrepreneurial activities, is particularly relevant because, despite early efforts to include women throughout the improved cook stove value chain, the marketing and sales force remains dominated by men (Ramanathan & Carmichael, 2008). Data from Global Entrepreneurship Monitor, Women's Report (2013) has noted that in every economy sampled, women had lower capability perceptions and greater fear of failure compared with men. Moreover, women disproportionally face psychosocial challenges that impede their self-efficacy, motivation, and drive to take on new endeavours (Chegini, 2010).

This initiative qualifies to be termed as successful in addressing the urgency of clean energy transition by reaching consumers who were enrolled for PMUY but were reluctant to avail LPG refills due to economic reasons. A recent study on LPG adoption and impact of PMUY in rural Karnataka suggests that though many consumers enrolled for the scheme, it is not matched by the sales of LPG

cylinders (Kar et al., 2019). The study also finds that LPG refills remain low in rural Karnataka, especially among PMUY beneficiaries. Other studies have also demonstrated that women have the potential to increase sales and adoption when provided with other empowerment training like agency-based training (Shankar, et al., 2015a).

Hence, by leveraging women's ability to reach remote consumers, this initiative by TIDE has been able to increase access to energy and empower women at the same time.

Socio-cultural norms: caste and gender

TIDE's intervention, which enabled financial autonomy for women cook stove builders, also posed several challenges for them within the village community. The caste of certain women cook stove builders became a hindrance for them in terms of business opportunities. Though Constitution and emergence of human rights norms have eroded the legitimacy of caste-based discrimination, it is silently practised in several parts of the country, including the study villages. For instance, certain occupations like barber and cobbler amongst others are carried out exclusively by members of certain castes even today. Likewise, heterogeneity in caste preference for marriage is not acceptable and the decisions of match making are managed by parents. However, it is also interesting to note that there is an increasing process of "*sanskritisation*" in the villages, which is exemplified by the convergence in habits, practices, festivals and rituals, towards the direction of the upper caste. Also there is no discrimination in the use of public utilities like stand posts and hand pumps across caste categories.

Nevertheless, the silent or invisible practices of caste discrimination in the community became evident when women cook stove builders of lower castes were not allowed to enter kitchens of upper-caste households to build cook stoves. Kitchens and food in Indian (mostly Hindu) culture are associated with purity, and the presence of lower-caste people in the kitchen, who were in older times considered impure, is still considered to defile the purity of the place.¹⁶ A study on caste discrimination in rural Karnataka showed maximum number of respondents from the study sample of Tumakuru did not allow people of lower castes to enter kitchens of upper-caste households (Maruthi & Peter, 2018). Hence, the women cook stove builders had to face this socially constructed hierarchical bias in their jobs as they were allowed only to enter kitchens and build stoves for members of their own caste and not others. Hence at an individual level, women of lower castes occasionally suffered disproportionately from psychological disempowerment.

Such discrimination was also seen between the prominent *Lingayat* and *Vokaliga* communities, the main reason being the difference in food habits practised by the communities. *Vokaligas*, who are principally non-vegetarians, are afraid to enter the kitchen of vegetarianism practicing *Lingayat* due to the notional concept of "purity".

Expressing her views as a cook stove builder, Hemalatha from Shivasandra village said, "can you even believe that in spite of the fact that we celebrate festivals and fairs together, I am not allowed to build stoves in the *Lingayat* households just

because we are non-vegetarians?” She further added that, “even though am a proud Vokkaliga, such discrimination by fellow Lingayats in such matters is really hurtful”.

Due to these notions of purity and impurity, the women entrepreneurs found it more beneficial to work in villages other than their own where their caste identities could easily be camouflaged and be less marked by exclusion, and also where they were identified more for their work. It may also be due to the relatively higher degree of mobility enjoyed by women of lower castes than those of upper castes, where customs are more orthodox and restrictive, especially in terms of women’s mobility. Earlier studies have noticed that increased caste status is associated with a greater subordination of rural women (Banerjee & Raju, 2009; Eswaran, Ramaswami & Wadhwa, 2013; Joshi et al., 2017) and this is even indicated in lower levels of labour force participation by them. On the other hand, women from low-status castes display higher labour force participation rates, fewer patriarchal restrictions on mobility and greater decision-making autonomy (Chen, 1995; Kapadia, 1995; Eswaran, M., Ramaswami, B., & Wadhwa, W., 2013). However, a related argument is that increase in wealth and income among low-ranked castes can have a negative impact on the status of women: as these castes emulate the customs, practices and patriarchal codes of higher-ranked castes, women become disempowered (Srinivas, 1977) and it also brings status-enhancing restrictions on their mobility and decision making (Still, 2017; Deshpande, 2017).

Conversely, in the study villages, the factors of masking caste identity have helped lower-caste women escape the discrimination experienced back home and enjoy new freedoms and formerly denied social honour by working as cook stove builders in the neighbouring villages. Hence, some of the most productive entrepreneurs of the lower castes accessed markets beyond their immediate locality and this also resulted in far-reaching stove diffusion. Studies have also shown that migrants could experience better working conditions with mixed caste groups and forge better relations with them (Mosse, 2018). However, the study does not indicate that the lower-caste women entrepreneurs have managed to improve their collective social standing within the village of their origin.

For an organisation like TIDE, which strives to bring changes through women’s entrepreneurship and subsequent empowerment through designing market and policy initiatives, which give women from all background an opportunity to become entrepreneurs, neutralising the influence of repressive caste- based norms and its undesirable outcomes becomes a difficult proposition.

Empowerment and social change

The stove builders of the study villages are prime examples of how entrepreneurship-based empowerment training and personal initiative could potentially increase women’s abilities to be successful energy entrepreneurs. However, while the women cook stove builders discharged their duties effectively in their own and neighbouring villages, they did not anticipate another challenge – pre-existing gender norms, which are often discriminatory towards women. Such norms follow from long-standing traditions of patriarchy, which dictate standards of

morality and behaviour for women, to mould them into socially acceptable ideals of a “good woman”. As the stove builder programme involved routine travel for women to other villages and even states to receive and to impart training, initial reluctance came from the women themselves as they feared the opinion of society. Patriarchal societies often label women as “loose” and cast aspersions on their character for moving freely, without being accompanied by male or older female relatives (Batliwala et al., 1998).

Shivamma, a successful cook stove builder and a mother of two opined that, “While I was excited to be a cook stove builder, my initial fear was what people will say? I hail from a respectable family”. Another cook stove builder, Jayamma, couldn’t agree more. She commented, “Appropriate social behaviour for women is always decided by men, and women are just expected to be obedient and submissive”.

Slander on women’s conduct also happened when male members from TIDE’s team accompanied them to outstation trainings. TIDE’s team being gender diverse would have both men and women accompanying the cook stove builders for outstation visits. However, men travelling with women irrespective of their caste background were not appreciated by the community. Gupte (2013) observes that honour is largely centred on the behaviour of women and as Welchman & Hossain (2005) argue, is vested in male control over women and specifically women’s sexual conduct. Although concerns regarding the safety of women cook stove builders while travelling were also raised, unwanted moral judgements were made on the conduct of these women disregarding the women’s own notions of propriety, morality and appropriate social behaviour. Scholarly work has also clearly indicated that while male honour rests on their ability to control women’s bodies (Rao, 2018; Hebbar, 2018), female honour entails conforming to appropriate and sanctioned roles and codes of conduct (Still, 2011; Grover, 2011). All these problematic and contentious concepts of women’s honour directly and indirectly reinforced the patriarchal conservatism in the study villages and dissuaded some of the stove builders from expanding their geography of work and pursuing newer avenues.

Women cook stove builders, hence, were constrained by social norms of defined honour morality, imposed on them beyond their households, which dictate their roles and behaviours, their ability to make choices, achieve their goals, and control their lives. These factors limited the space for women to exercise their newly acquired empowerment through entrepreneurship. Moreover, the notion of economic empowerment becomes relative and dependent on their positioning within the larger milieu of gender norms. Such instances reveal how deeply entrenched norms do not get dispelled despite progress on other indicators of social development such as a high literacy rate (around 75% for Tumakuru). Other studies have also clearly revealed that social empowerment is still hindered by factors like intra-household dynamics, women’s traditional positions in society and other restrictive social norms, and could off-set the economic impacts of empowerment training such as increasing their skill set and market linkages (ILO, 2017).

Overall, the programme has been successful in adding value to the emerging energy justice debate by empowering women as entrepreneurs and simultaneously

addressing the issue of urgency of clean energy transition through successfully diffusing clean cook stoves. The increased empowerment of women within the household was, however, not reflected in the wider community due to compounding constraints based on caste or perceived morality and at times resulted in social ostracisation. Nonetheless, trained women from all caste groups continue to be entrepreneurs and have experienced economic empowerment. As the programme pays sufficient attention to scalability to serve a larger customer base, it continues to attract women to enroll in their entrepreneurial trainings. Therefore, more opportunities need to be created for women in all quarters to bring about structural changes in their social position.

Conclusion

By building women's ability to become energy entrepreneurs, TIDE attempted to effectively address the urgency of transitioning to clean energy and empowerment of women at the same time. This furthered efforts to create just energy systems by transforming benefits to the household and individuals. Women's ability to earn their own income also increased their sense of status and bargaining power within the household and their agency to accumulate autonomous assets.

However, the existing and endured caste-based contexts permeated into everyday life and determined the endowments and opportunities available to women and constrained their agency beyond household. Although TIDE trained women as stove builders and master trainers from all communities, in a bid to form progressive civility in a seemingly caste discrimination-free community, in practice the trained women could not be agents for the elimination of caste practices, but rather became inadvertent actors in their reconstitution. While it is commonly accepted that caste is monopolistically practised in the "private space", women cook stove builders had to face this hierarchical bias in their jobs in the form of exclusion as they were allowed only to enter kitchens and build stoves for members of their own caste and not others. As a result, women cook stove builders were forced to go to other neighbourhoods or regions where their caste identity could easily be camouflaged.

Women cook stove builders also encountered another peculiar challenge when they had to travel outstation for trainings, along with men from TIDE. While concerns were raised about safety and security, moral judgements were also made on their conduct since they are expected to be bearers of the honour of the family and the community. The so-called female honour which entailed conforming to appropriate and sanctioned roles and codes of conduct disregarded women's own notions of propriety, morality, and appropriate social behaviour. Hence, such "concerns" often resulted in reduced mobility for women and hampered broadening their horizons.

In societies that are characterised by spatially distributed caste practices and where gender prejudices are disguised as concerns, bringing in social change by just introducing technological solutions and creating entrepreneurial opportunities for women may seem to be a difficult and highly optimistic proposition. For an organisation like TIDE, which strives to bring changes through women's

entrepreneurship and subsequent empowerment, addressing such entrenched caste and patriarchal control may not be an immediate possibility. Nevertheless, the noble goal of creating women entrepreneurs should not be abandoned; rather it should hinge on more inputs from various quarters including state and society to bring about concrete transformative changes, since gender norms are not static or timeless social structures but a shifting complex of social relationships.

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Notes

- 1 Any type of cooking is considered to be safe if it is more fuel efficient and/or emissions meet WHO guidelines. Currently available options that can be considered clean include: electricity, renewable energy (solar), Liquid Petroleum Gas (LPG) and highest performing biomass stove. Most of the high performing biomass stoves may often not meet the WHO guidelines, but offer some benefits and can be a transitional or interim solution when different forms barriers prevent access to the cleanest options.
- 2 <https://pmuy.gov.in>
- 3 www.seforall.org/interventions/big-markets-for-clean-fuels
- 4 Below Poverty Line.
- 5 1 INR = 0.014 USD (as on 7 September 2020).
- 6 Caste or *jati* is believed to have originated from the Varna system (roughly 3000 years old) where the society was categorised into mutually exclusive, endogamous, hereditary and occupation specific groups: Brahmins (the priests and teachers), Kshatriyas (warriors and royalty), Vaisyas (traders, merchants, and businessmen) and Sudras (all manual jobs) at the bottom.
- 7 <http://hdr.undp.org/en/content/gender-development-index-gdi>
- 8 Sanskritisation is a process of imitation by which a lower caste or tribe or any other group changes its customs, rituals, ideology and way of life in the direction of a higher or more often twice-born caste (Srinivas, 1995).
- 9 As with any affirmative actions, caste-based quotas are mired in controversy, where scholars have argued for upholding of meritocratic values as well as raised the need for reservation for economically weaker sections irrespective of caste background.
- 10 Sociological abstracts have quoted that the proportion of studies that rely solely on focus groups has been increasing in recent years (Morgan, 1996).
- 11 Taluk: sub-division of district.
- 12 For details, please visit www.ctc-n.org
- 13 www.investkarnataka.co.in/district-profiles-tumakuru
- 14 Panchayat or Village Council refers to an elected body at the village level for local self-governance.
- 15 The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), enacted in 2005, provides legal right to wage employment for guaranteed 100 days a year, to rural households.

- 16 Discrimination is also prevalent in Indian Christianity. The Hindu Dalits converted to Christianity continue to be referred to by their caste names. Conversion to Christianity has not changed the social condition of the Dalits. Prakash Louis. (2007). Dalit Christians: Betrayed by State and Church. *Economic and Political Weekly*, 42(16), 1410–1414. Retrieved April 28, 2020, from www.jstor.org/stable/4419488

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