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Frugal entrepreneurship: Resource mobilization in resource-constrained environments

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Frugal entrepreneurship (FE) is a recent pursuit that has evolved from the frugal innovation (FI) concept. How frugal entrepreneurs mobilize resources is both interesting and novel, yet it remains an underresearched area. The objective of this study is to explore how frugal entrepreneurs mobilize resources at the grassroots level of emerging markets to realize their innovation and entrepreneurial aspiration. Based on six cases of frugal enterprise, this study contributes to the FE literature in particular and FI more generally. We reveal the various resources that frugal entrepreneurs mobilize and how they mobilize them in three broad categories, namely, human, social and financial. Unlike other entrepreneurs, frugal entrepreneurs usually possess manual work skills, and they help each other with their technical, financial and other knowhow. They understand their context and culture and consider them deeply when developing frugal solutions. Indeed, frugal entrepreneurs integrate the culture and context into their innovation process, because they themselves are embedded in the same society. Patents do not help entrepreneurs to protect their innovations, however, and they need to rely more on informal rather than formal finance.

KEYWORDS

frugal entrepreneurship, frugal innovation, resource constraints, resource mobilization

1 | INTRODUCTION

How entrepreneurs generally mobilize resources is a pivotal question (Kotha & George, 2012), but how frugal entrepreneurs mobilize resources is a particularly interesting and novel research area. Frugal entrepreneurship (FE) has emerged as a concept very recently (Hossain, 2019; Hossain & Sarkar, 2021; Michaelis et al., 2020), having evolved out of the frugal innovation (FI) concept (Hossain, 2018; Zeschky et al., 2011). Essentially, it is an entrepreneurial endeavour based mainly on one or more FIs, which are affordable products, services, processes or business models that have been devised to meet the needs of low-income customers (Hossain et al., 2016; Zeschky et al., 2011). It is perhaps the most recent concept in the growing academic literature for innovation and entrepreneurship.

Entrepreneurship and resources are equally important for sustaining business growth (Dodd et al., 2021). We know that entrepreneurship can help improve people's lives and drive economic growth (Ahlstrom, 2010), so FE is crucial for raising living standards in developing countries, where conventional products are often prohibitively expensive for many. FE at the grassroots level represents a promising means for solving many pressing problems faced by low-income customers in developing countries (Dabić et al., 2022) by providing cheaper alternatives to unaffordable conventional products and services in a highly constrained environment (Agarwal et al., 2016; Vesci et al., 2021). Indeed, FE can turn constraints into opportunities by creating new products that meet the needs of underserved low-income customers. Frugal entrepreneurs explore untrodden paths in resource-constrained environments where institutional voids, weak intellectual

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property protection and a lack of support structures are commonplace (Mair et al., 2012).

FIs from medium and large firms are nothing new, with GE's portable ultrasound machine, Tata's Nano car (Rao, 2013; Ray & Ray, 2011) and Aravind Eye Care (Agarwal et al., 2020) having received significant attention from scholars and practitioners. Their emergence at the grassroots level, however, through ordinary individuals is surprising and worth exploring. Indeed, FIs such as MittiCool's clay fridge and Jayashree's sanitary napkin emerged at the grassroots level, and they may be even more significant because they came from unexpected sources (Hossain et al., 2021; Prabhu & Jain, 2015). FE at the grassroots level provides an opportunity to explore entrepreneurship within a new context. Studies into such ventures from an entrepreneurship perspective are limited, and to the best of our knowledge, no scholarly study has investigated the resource mobilization of frugal entrepreneurs. This study therefore aims to explore how frugal entrepreneurs mobilize resources at the grassroots level of emerging markets.

This study considers six cases from three states of India, which is an epicentre for FE (Hossain, 2017). We find that frugal entrepreneurs mobilize human, social and financial resources in different ways and that they possess technical and other manual work skills. They also tend to help each other in terms of technical, financial and other skills. They often repurpose locally available resources, including used or discarded materials, and culture and context are integral parts of their innovation process. Although entrepreneurs patent their innovations, this does not suffice to protect their intellectual property rights.

The remainder of this paper is structured as follows: First, we take stock of the literature related to FE and resource mobilization. Section 3 then describes the research context and data collection and analysis, with the findings being presented in Section 4. The final section then indicates some implications and limitations and suggests avenues for future research.

2 | FE AND RESOURCE MOBILIZATION

2.1 | FI and FE

FI has been defined in numerous ways, including as '*a resource-scarce solution (i.e., product, service, process or business model) that is designed and implemented despite financial, technological, material or other resource constraints, whereby the outcome is significantly cheaper than competitive offerings (if available) and is good enough to meet the basic needs of customers who would otherwise remain underserved*' (Hossain et al., 2016, p. 133). Studies of FI have embraced a range of aspects, including sustainability (Albert, 2019; Hossain et al., 2021; Khan, 2016; Levänen et al., 2016, 2022; Rosca et al., 2017; Shibin et al., 2018), business models (Hossain, 2021a; Winterhalter et al., 2017), artificial intelligence (Govindan, 2022), fighting the COVID-19 pandemic (Corsini et al., 2020; Sarkar, 2020; Vesci et al., 2021), frugal patents (Kronmeyer et al., n.d.), knowledge transfer (Altmann & Engberg, 2016), diffusion (Hossain, 2020) and more

recently on how to design and innovate frugal products (Brem et al., 2020). FIs differ in the sense that they trickle up from emerging markets to developed ones (Simula et al., 2015), something that is rather unconventional (Hossain et al., 2016). Scholars are also accused of exaggerating its positive side (Hossain, 2021b).

The investigation of the FE phenomenon has only started recently (Hossain & Sarkar, 2021), and this has featured in some recent studies (Hossain, 2019; Hossain & Sarkar, 2021; Michaelis et al., 2020). FE refers to a form of entrepreneurship based on bringing an affordable innovation to market with limited resources in a highly constrained environment (Hossain & Sarkar, 2021; Michaelis et al., 2020). In other words, it means pursuing an unexploited opportunity under extreme resource constraints (Ma et al., 2015). Prior research in China has indicated that FE offers a more affordable means of value creation for resource-constrained firms in a specific market context with unfathomable amounts of nonconsumption (Ma et al., 2015). At the initial stage, entrepreneurs typically lack the capital, materials and expertise to exploit the entrepreneurial opportunity (Shane, 2003). They then face further resource constraints as they try to develop their products and scale up their ventures. Resource constraints can be a double-edged sword, however: Prior research has indicated that under certain conditions, resource constraints can promote innovation and entrepreneurship (Agarwal et al., 2016; Lim et al., 2013). Indeed, they may evoke a desire to solve the burning problems of society through tinkering, bootstrapping, and so on (Gibbert et al., 2014). Unfortunately, we know little about how entrepreneurs overcome constraints to accomplish their objectives effectively (Desa & Basu, 2013). FI plays an important role in sustainable development (Niroumand et al., 2019; Nylund et al., 2021), and FE at the grassroots level is a promising practice for making products and services accessible for low-income customers (Gibbert et al., 2014). Prior research indicates that young entrepreneurs can overcome innovation constraints by recruiting from rivals (Rao & Drazin, 2002), but this does not work at the grassroots level of emerging markets. By nature, FE makes minimal use of resources and is tailored for contexts with weak infrastructure (Corsini et al., 2020; Zeschky et al., 2014). Therefore, understanding the resource mobilization of frugal entrepreneurs is significant.

2.2 | Resource mobilization

Resource mobilization is defined as a process for recognizing, acquiring and integrating the resources needed for a business to take advantage of an opportunity (Stuart & Sorenson, 2007). In other words, it is the process through which ventures gather resources to exploit a business opportunity (Clough et al., 2019). Resource mobilization can be achieved with the help of external organizations (Ito, 2018), or firms may optimize their resources by identifying alternative, diverse sources. Powerful parties typically control the resources that firms need, so frugal entrepreneurs face severe difficulties in securing these resources from such powerful parties. However, we have some limited theoretical development for how entrepreneurs mobilize resources, specifically when conditions make it challenging to access

capital markets (Desa & Basu, 2013). Resource mobilization is clearly a key entrepreneurial activity, because resources play a significant role in product development (Knizkov & Arlinghaus, 2020; Plambeck, 2012) and business growth (Van de Ven & Jing, 2012; Villanueva et al., 2012). Resource mobilization takes place in three sequential steps, namely, to search for, access and transfer resources (Clough et al., 2019). The performance of entrepreneurs is closely related to their access to specific resources (Hillman et al., 2009), and they use their networks to connect with various individuals and organizations to mobilize the necessary tangible and intangible resources to seize business opportunities (Honig, 1998). Some scholars have classified resources into the three main categories of human, social, and financial (Batjargal, 2007a; Clough et al., 2019; Florin et al., 2003).

Human capital includes education, training and experience (Linder et al., 2020). Entrepreneurs gain experience from running a business (Unger et al., 2011), and the entrepreneurial experiences of parents may affect the human capital of entrepreneurs through role models and knowledge sharing (Bosma et al., 2012). The development of human capital is intertwined with the individuals involved, and it can affect the identification and exploitation of opportunities, but whether it has a positive relationship with entrepreneurial performance is not clear. Some studies find a strong relationship (Unger et al., 2011), while others find a weak one (Davidsson & Honig, 2003).

The resources available to entrepreneurs in the form of social associations are called social capital (Adler & Kwon, 2002), and this plays an important role in resource mobilization (Maurer et al., 2011). It refers to assets derived from social networks (Batjargal, 2007b) that have been created by investing in social relationships (Linder et al., 2020). Social capital theory asserts the pivotal benefits of social relationships (Aldrich & Martinez, 2007), and in some cases, entrepreneurs' social resources are more important than their personal resources (Lin, 1999). For example, social and family ties strengthen an entrepreneur's ability to mobilize resources (Kotha & George, 2012), but grassroots entrepreneurs' social networks are limited to their locality (Hossain & Sarkar, 2021). Social capital includes social structure and individuals who are within the structure (Coleman, 1988). Social networks are closely associated with culture (Guiso et al., 2008) and context (Dudwick et al., 2006). Social networks also affect innovation-related activities (e.g., patent protection) (Kaasa, 2009).

Financial capital is a key resource for entrepreneurship, because it can be transformed into other resources (Wiklund & Shepherd, 2005), such as by hiring a highly connected person (Linder et al., 2020). Financial capital therefore has a significant effect on the success of a new venture, but frugal entrepreneurs are more heavily affected by financial constraints (Colombo & Grilli, 2005). Financial capital helps to overcome the 'newness' of an enterprise by allowing entrepreneurs to fill their skill gaps and become better equipped for their entrepreneurial activities (Gimenez-Fernandez et al., 2020), thus providing a buffer for further exploring opportunities in depth (Cosh et al., 2009). Human capital interacts with financial capital, and prior research has shown that studies focus disproportionately on financial resources (Clough et al., 2019), yet they have the strongest effect when combined with other resources (Chandler & Hanks, 1998).

Prior research suggests that a venture having an optimal amount of human, social and financial capital is unlikely (Brush et al., 2001), and grassroots entrepreneurs seem to mostly lack financial capital. Indeed, the other two forms of capital are often available within their localities to some extent, but we know little about how these entrepreneurs mobilize different types of resources for their businesses. Hence, we contribute to the entrepreneurship literature by addressing the key question of how frugal entrepreneurs mobilize resources at the grassroots level of emerging markets.

3 | METHODS

3.1 | Research context

This study focuses on how frugal entrepreneurs mobilize resources at the grassroots level. We chose rural India as the research context due to its extreme resource constraints, with about a quarter of the world's poor living there. India is considered the most popular country for FE (Hossain, 2017), and we chose cases that were widely cited in media outlets and academic discourse. We considered the following criteria when selecting cases: (a) the founders had been widely referred to as frugal entrepreneurs, (b) they originated in rural India, (c) they were commercially successful and (d) the innovators had limited academic qualifications. For example, most of the innovator-entrepreneurs were school dropouts, with only one having completed his schooling. We explored six cases, which is consistent with prior qualitative studies using the multiple-case method (Brown & Eisenhardt, 1997). Four cases were from Gujarat, one was from Karnataka and another was from Tamil Nadu.

3.2 | Data collection

Table 1 gives an overview of the six cases and the data. We identified the cases through extensive desk research, while the data were collected from multiple sources, namely, from in-depth interviews with key informants, archival documents and observations during field visits. Multiple data sources were used for triangulation to increase the validity of the study (Burton & Obel, 2011).

To understand the current state of the cases, we started collecting secondary documents from all possible online sources, something that was continued throughout the data collection process. Our data included a large number of video clips that were very insightful, especially as such clips allowed us to better understand the various facets of products, processes and other mechanisms. We conducted 12 in-depth interviews in total using open-ended questionnaires, thus allowing interviewees to express their opinions as they saw fit. The interviews were conducted in either Hindi or English, and each one lasted from 40 min to a full day. These interviews were partially recorded as it was not practical to record them fully. Moreover, the interviewer typically spent a full day on each premise, and this allowed

TABLE 1 An overview of the six cases and data

Case	MittiCool	Jayashree industries	Ksheera enterprises	Dolphin enginech	Dipvijay industries	Chetak
Entrepreneurs	School dropout technician	School dropout technician	Schoolteacher	School dropout technician	School dropout technicians	School dropout technician
Company size (employee)	50	5	30	10	10	10
Enterprise Origin	Gujarat	Tamil Nadu	Karnataka	Gujarat	Gujarat	Gujarat
Products	Clay cookeries	Sanitary pad making machine	Milking machine	Bamboo splint making machine	Cotton wick making machine	Cotton-stripping machine
Interviews	Inventor - Head of sales	- Inventor - A social entrepreneur	- Inventor - Manage, Sales - Manager, HR	- Inventor	- Two inventors	- Inventor
Informal discussion	- Factory Engineer - Office Secretary	Manager	Several factory workers	- Two workers - Manager	-	-
Secondary data	- 39 documents - 44 videos - Company website documents - Field notes and memos	- 26 documents - 67 videos - Company website documents - Field note	- Nine documents - Four videos - Company website documents - Field notes	- Four documents - Company website documents - Field notes	- Four documents - 14 videos - Company website documents - Field notes	- Five documents - 11 videos - Company website documents - Field note

Note: N.B. Prof. Anil Gupta was interviewed several times on different occasions. He leads four organizations that support these four frugal entrepreneurs in different stages.

the interviewer to interact with the interviewees and other people in informal settings. The interviewees were key informants, such as inventor-entrepreneurs, CEOs and division heads, such as for sales and human resources. All the interviews in Gujarat took place in Hindi, while those conducted in Tamil Nadu and Karnataka were in English. An author travelled from Europe to India to visit the premises and factories of the case companies to get a first-hand perspective. This allowed the author to observe various activities and interact with workers, and these field visits allowed him to understand the context better. In addition, detailed field notes were taken before, during and soon after each interview, and all recorded interviews were transcribed. To ensure the validity of the study, we carefully controlled data collection. One author directly conducted all the interviews to ensure the integrity of the data. We also cross-checked interview data with other diverse sources of data, such as secondary documents and third-person accounts, for triangulation purposes (Delmas et al., 2013).

3.3 | Data analysis

We applied a qualitative approach with a multiple-case method (Eisenhardt, 1989). A qualitative study was appropriate because our study aimed to answer a 'how' question (Yin, 2017). The multiple-case method is widely used in innovation, entrepreneurship and other management studies (Gioia et al., 2013), and a case study is a well-recognized method for exploring, refining and extending

existing theories and developing new theories (Eisenhardt, 2021). The data analysis comprised two main stages: First, we developed a narrative stock of our findings by chronologically ordering the main events for each case. We started with the MittiCool case and followed it with the case of Jayashree Industries. The reason for beginning with these two cases for individual analysis was because they had received more attention than the other cases. They had been widely covered by not just local media outlets but also international media outlets, with a series of events being relatively easy to identify. Next, we continued our individual case history analysis in the following sequence: Ksheera Enterprises, Dolphin Enginech, Dipvijay Industries and Chetak. The narrative stock revealed how the enterprises had evolved from inception to the current day.

The secondary data were very helpful for developing a timeline and corroborating the key resource-related events and decisions taken by the entrepreneurs. Media reports provided comprehensive information about the resources the entrepreneurs lacked and what they did to overcome this. For example, the MittiCool founder had to use his ancestral home as collateral for a bank loan. The founder of Chetak, meanwhile, had to borrow money from his close friends to support his entrepreneurial activities. The interview data were then useful for fleshing out these timelines with first-hand knowledge. Following well-recognized guidelines from management research (Gioia et al., 2013), we cycled back and forth between the data, data analysis and the existing literature to develop theoretical insights (Miles & Huberman, 1984).

We used the Atlas.ti software for powerful qualitative data analysis, with all the documents, including the transcribed interviews, being uploaded to the Atlas.ti portal. We started open coding by reading the documents line by line and coding different types of resources that were depicted in the documents. We kept in mind the three main resource categories (human, social and financial) and the different resources under each category. We noticed that themes and aggregate dimensions soon emerged, but we continued coding with an open mind. As expected, we found some overlapping codes. For example, actors under the social capital category could also be categorized as human capital. We merged our codes and coded them further based on the context. After finishing open coding over several repetitions, as reported in Figure 1, we conducted axial coding to find high-level categories (Strauss & Corbin, 1990). We soon identified some resources—such as skills, culture and context—that emerged as dominant themes. Some themes, such as resource repurposing, were very novel because they specifically related to FI. Despite the emergence of themes and aggregate dimensions at an early stage of data analysis, we continued with an open mind to assess the initial data coding. Open coding enabled us to identify initial concepts, but in the second-order analysis, we developed broad themes. We repeatedly examined the data from theoretical perspectives to find discrete patterns. In the second-order analysis, we examined the data, checked its consistency and extracted theoretical patterns. We checked various codes to develop the data structure and eventually achieved theoretical development. Thus, we identified themes and aggregate dimensions (Corley & Gioia, 2004), and we present the findings of this in the following section.

4 | RESULTS

Figure 1 shows the data structure, while Table 2 lists some themes and representative quotes. Clusters of second-order themes emerged from the data, and we classified them into three broad categories, namely, human, social and financial.

Human capital is a key resource type for FE. Entrepreneurs first develop their innovative products and then start an entrepreneurial venture based on them, so innovative traits are crucial for FE. A key characteristic of all the innovators is their technical skills, with them all having worked as technicians in various roles. However, the innovators did not have the full range of technical skills to develop their ideas, so they needed close support from other people and organizations to complement their technical skills. Having access to technically skilled people is crucial. In Gujarat, for example, there are many technicians, because this region hosts many technology-based businesses. Moreover, several institutions provide aspiring innovators with technical or other support. Aside from technicians, however, highly educated experts are also pivotal in providing scientific support. For example, when Mansukhbhai Prajapati developed his clay fridge, he needed to know the optimal combination of different raw materials to produce an effective clay fridge. The availability of technical skills and the willingness of highly experienced engineers and technicians to support innovators, especially through formal institutions, represent crucial human resources. In some cultures, people may offer help to their fellows without expectation of reward. Moreover, formal institutions play a key role in developing an ecosystem where people with expertise help each other. The National Innovation Foundation in

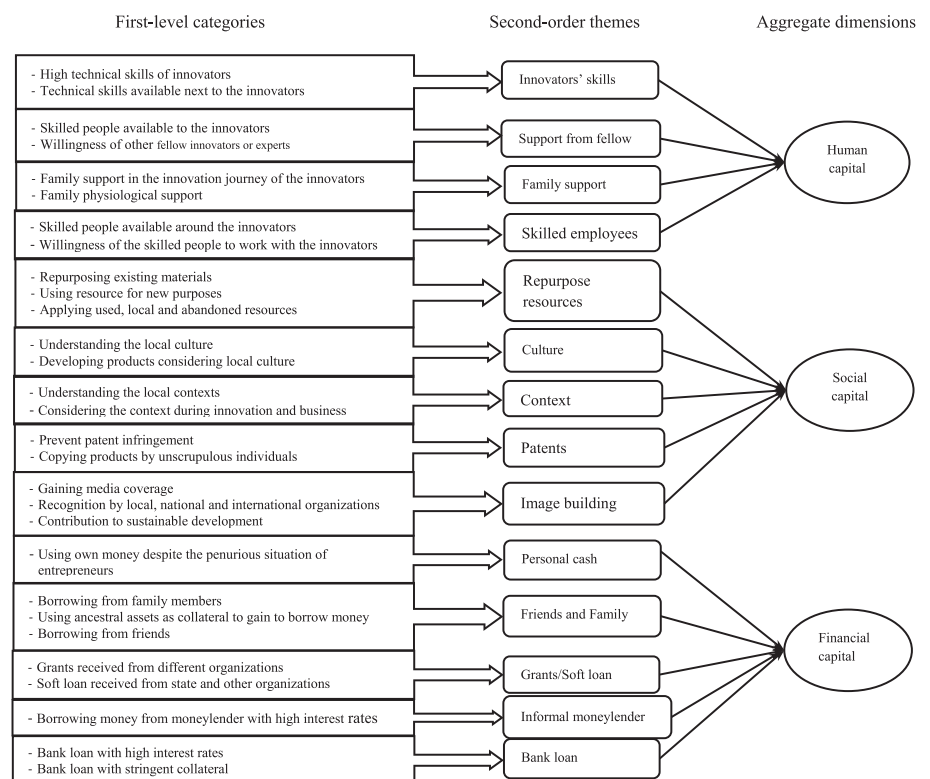


FIGURE 1 Data structure. [Correction added on 23 May 2022 after first online publication: Figure 1 has been updated in this version.]

TABLE 2 Representative quotations underlying first-level categories and second-order themes

Aggregate dimensions	Second-order themes	Exemplary quotations
Human capital	Innovators skills	<ul style="list-style-type: none"> I have worked as a helper to pottery work, a tea seller, cookery items peddler and a tiles making technician (Founder, MittiCool). I worked in a lathe workshop helper, lathe technician, insurance seller, firming day labour (Founder, Jayashree Industries). I worked as a cotton field helper, helper in a steel tube manufacturing company, and an electrician (Founder, Chetak).
	Support from fellow innovators	<ul style="list-style-type: none"> I supported them (Founders, Dipvijay Industries) in developing their cotton wick making machine (Founder, Dolphin Engimech). Supporting each other is important that is why we encourage all the grassroots innovators to help each other (Prof. Anil Gupta, Founder, Honey Bee Network).
	Family support	<ul style="list-style-type: none"> My wife makes awareness, sells and gifts sanitary in our community (Founder, Jayashree Industries). Now my younger son runs the business, the older son also helps in the business and I just take care of factory works (Founder, MittiCool).
	Skilled employees	<ul style="list-style-type: none"> The factory workers are mostly the students of my dad or the students of the school where my dad used to work. They are happy to have the opportunity to work locally (Head of HRM, Kasheera Enterprise). I have trained the local people so that they can work in my factory and they are locals so my employees and we are happy (Founder, MittiCool).
Social capital	Repurpose resources	<ul style="list-style-type: none"> We encourage entrepreneurs to use banana fibre and bamboo fibre instead of cellulose fibre as raw materials to make sanitary pads (Founder, Jayashree Industries). We use cow dung as raw materials to make pots (Founder, Dolphin Engimech).
	Culture	<ul style="list-style-type: none"> Using Clay potteries as kitchen items is an integral part of our culture (Head of Sales, MittiCool). In our culture, we help each other. Now, I am trying to set (establish business) my younger brother (Founder, Dolphin Engimech).
	Context	<ul style="list-style-type: none"> Western firms do not understand the context to develop grassroots innovation and to serve the purpose of marginalized people. Frugal products of grassroots entrepreneurs try to fulfil the needs of these marginalized people (Prof. Anil Gupta, Founder, Honey Bee Network).
	Patents	<ul style="list-style-type: none"> My machine is substantially copied. Copying is allowed because it (India) is a

TABLE 2 (Continued)

Aggregate dimensions	Second-order themes	Exemplary quotations
	Image building	<p>huge country (Founder, Jayashree Industries).</p> <ul style="list-style-type: none"> • We have the patent but it is not enough because patent laws are not properly used in India and it is very difficult to deal with so many people who copy our products in different locations in India (Founder, MittiCool). • In 2003, three of them patented in the USA to prove that our technology is ahead of American technology. Some copied their machine. Basically, copying is easy but it is not easy to be successful (Prof. Anil Gupta, Founder, Honey Bee Network). • Many multinationals approached us for joint ventures. We declined because we do not want to have a joint venture and we do not want to lose our brand name (Founder, MittiCool). • Our success is entirely down to word-of-mouth publicity (Founder, Jayashree Industries).
Financial capital	Personal cash	<ul style="list-style-type: none"> • I used my personal funding from my salary and farming income to support my business at the initial stage (Founder, Ksheera Enterprise). • I did not have any personal cash to support my work and no one was willing to support me (Founder, Jayashree Industries).
	Friends and family money	<ul style="list-style-type: none"> • When I finished with my own money, then a friend of mine was generous to lend me (Founder, Chetak)
	Grants/Soft loan	<ul style="list-style-type: none"> • Mr. Mansukhbhai Patel, founder of Chetak could secure a \$8000 under Technopreneur Promotion Program (The Hindi) • Prof Anil Gupta gave me financial support several times unconditionally (Founder, MittiCool).
	Informal lender	<ul style="list-style-type: none"> • I took \$415 from an uncle to start a factory (informal moneylender) (Founder, MittiCool).
	Bank loan	<ul style="list-style-type: none"> • Jivan Commercial Cooperative Bank gave me \$9500 lakh at an 18% interest rate with a collateral of our ancestral property (Founder, MittiCool). • I did not take any bank loan as mostly I get orders with initial payment from the customers (Founder, Jayashree Industries).

India has built a network for successful and aspiring innovators to exchange knowledge and skills.

In all six cases, family members are closely involved in the business, often working for the business without remuneration. All six cases eventually became family businesses, with many family

members working in the business on a full- or part-time basis. Moreover, psychological support from family members is an important initial asset for such entrepreneurs. Along with the skills of innovators and their family members, having other skilled people around the entrepreneur is essential for a successful business. Entrepreneurs

sometimes need to bring skilled people from distant locations to solve some minor problems, because skilled people frequently migrate from rural to urban areas for a better life. Thus, finding highly skilled local people is challenging for frugal entrepreneurs. Entrepreneurs therefore train local people to perform different production tasks and other activities and try to retain them in the long term.

Social capital plays a pivotal role for frugal entrepreneurs at the grassroots level. Frugal entrepreneurs often develop products by repurposing existing materials. For example, Ksheera Enterprises used the mechanism of a gutter-sucking pump as the basis for developing a milking machine. MittiCool, meanwhile, used clay as the raw material for making its powerless fridges, while Jayashree Industries replaced cellulose fibre with banana and bamboo fibres as the raw material for making sanitary pads. Dolphin Engimech even used cow dung, which has little or no commercial value, to make pots. Entrepreneurs also often employ used materials, locally abundant materials and abandoned materials to develop their FIs. As the entrepreneurs are rooted at the grassroots level of rural India, they are well aware of the local culture, thus helping them to develop products that fulfil local needs.

Understanding the culture is a fundamental prerequisite for innovation. This is even more critical for FIs because they are intended to solve a problem in a particular culture. Innovators may consider many factors, such as the lack of access to electricity and the need to perform tedious, repetitive tasks manually. Indeed, MittiCool's fridge runs without electricity, thus enabling people without access to electricity to preserve their food, while Jayashree has developed affordable sanitary pads that break the social taboo on female menstruation in rural India. Dipvijay's machine for making cotton wick has eliminated some manual tasks, and Ksheera Enterprises has removed the need for manual milking. Thus, these entrepreneurs clearly considered their local culture very closely. Culture and context are closely related, and they are embedded within a society. The proximity of such frugal entrepreneurs to the target market enables them to understand the context well, and frugal entrepreneurs at the grassroots level repeatedly interact with this context when developing FIs.

Patents for innovations are not commonplace at the grassroots level, even though frugal entrepreneurs are encouraged and supported by formal institutions to get patents. Unfortunately, patents are not very effective at the grassroots level, with FIs often being widely copied by unscrupulous people. For example, copycat versions of MittiCool's fridges are sold in the same market, even by the same retailers at a lower cost, although the quality of these copies remains a concern. Patent protection is not adequately enforced in emerging markets and patent protection authorities neglect FIs because their entrepreneurs are not very influential. Indeed, entrepreneurs patent their innovations knowing that they cannot protect their intellectual property rights. For example, Chetak patented its cotton-stripping machine in the USA despite having no business there—it simply wanted to show that its technology was ahead of US technologies.

Frugal entrepreneurs pursue various activities to develop and maintain their images. They receive awards from local and international organizations and are widely covered by local and sometimes

international media, all of which helps them to build an image. Frugal entrepreneurs serve customers who are generally ignored by large firms, often contributing to female empowerment and sustainable development. They help their localities, such as by employing local people who may otherwise be unemployed. MittiCool also provides scholarships to some underprivileged students, and 25 local families have benefitted from its business.

Financial capital is a key resource for frugal entrepreneurs for many reasons. Informal sources tend to be the main funding options for frugal entrepreneurs, although they can secure financial capital from a range of sources, such as personal savings, family assets, grants, soft loans, informal moneylenders and bank loans. Entrepreneurs use their own money whenever they can, but they often live in very poor places with extreme poverty, so most entrepreneurs lack their own funds. Naturally, the next immediate source of funding is friends and family, but they are equally unlikely to have spare funds to lend to an entrepreneur. MittiCool founder Mansukhbhai Prajapati took a loan from an acquaintance and used his father's house as collateral for a bank loan. Similarly, the founder of Chetak took a loan from a friend to develop his cotton-stripping machine.

Frugal entrepreneurs receive awards from different organizations at local and national levels, sometimes including a financial element. For example, all the entrepreneurs considered in this study had received financial awards. Moreover, some states in India provide soft loans with very low-interest rates together with other support, such as Gujarat state government, which provides loans to entrepreneurs at a 1 per cent interest rate, as well as financial and other support for entrepreneurs to attend business fairs across India.

Securing loans from traditional financial institutions is almost impossible for frugal entrepreneurs, especially at the initial stage. The most common source for a loan is informal moneylenders, who usually charge high interest rates with stringent terms and conditions. For example, the MittiCool founder's initial funding for establishing production facilities came from an informal moneylender, although he made the loan based on the founder's integrity and his acquaintance with him.

5 | DISCUSSION

5.1 | Theoretical implications

To the best of our knowledge, this study is one of the earliest studies to explore FE and the first to explore resource mobilization for FE. Through the broad categories of human, social and financial capital (Clough et al., 2019; Linder et al., 2020), we explored how frugal entrepreneurs mobilize resources to develop their innovative ventures. Unlike many traditional entrepreneurs, frugal entrepreneurs possess technical skills because they have had manual jobs, such as working as electricians, lathe machine operators and factory helpers, and these skills play an important role in developing FIs. Family members and acquaintances are also important sources for acquiring and mobilizing social and financial resources. Such entrepreneurs operate

with family support, with many family members working as business partners, managers and employees.

Frugal entrepreneurs often provide significant support to each other. Their key strength, however, is their ability to utilize the social capital within their localities. They must use local networks and resources for their ventures because they have limited, if any, ability to network with international actors, so their products remain locally embedded. Thus, scaling up is a serious challenge for frugal entrepreneurs originating at the grassroots level.

Prior research indicates that frugal entrepreneurs repurpose resources or use locally abundant or discarded resources (Albert, 2019; Hossain, 2018; Leadbeater, 2014), and this study firms up these prior findings with empirical evidence. Frugal entrepreneurs also consider the local culture and market context from the very beginning of their endeavours. Surprisingly, entrepreneurs patent their innovations even though they know their products will be copied by unscrupulous people due to poor protection of intellectual property rights. This is an interesting phenomenon that is unheard of with other types of entrepreneurship. These entrepreneurs build a reputation but not through deliberate effort. Instead, awards and media coverage increase their visibility in the market, unlike conventional businesses that actively strive to build a reputation.

Figure 2 shows the overall implication framework. Skills, personal support from family members, friends and family, culture, context, IP protection, image and funding are the main drivers of FE. Awareness is created through external activities, but weak intellectual property hinders FE at the grassroots level. Entrepreneurs mainly focus on a single product when starting their businesses, and as these businesses grow, they extend their product lines to capture a greater share of the existing market, leading to further business expansion. FE develops at the grassroots level in emerging markets, so we have extended resource mobilization theory to a new context. Prior studies of entrepreneurship have mainly explored resource mobilization within social entrepreneurship (Desa, 2012), the entrepreneurial experience and equity distribution (Kotha & George, 2012). While social entrepreneurship is mainly based on conventional services or products

(Mair et al., 2012), FE at the grassroots level is predominantly based on frugal products, with frugal entrepreneurs employing bricolage to mobilize resources (Desa & Basu, 2013). We also revealed that frugal entrepreneurs find new ways to use existing resources. What is more, personal skills play an important role in developing frugal products, so developing skilled people seems to be critical for developing products that will meet the needs of underserved customers in emerging markets. Our theoretical understanding of the role that skilled people play in innovations for emerging markets is limited, so we have extended the existing list of factors that promote FE (Niroumand et al., 2019). Moreover, well-established funding sources—such as venture capital, angel investors and crowdfunding—are absent for frugal entrepreneurs, so studies into such funding for FE may add a new dimension to the FE literature.

5.2 | Practical implications

This study indicates several implications for managers of conventional businesses and supporting organizations to consider. The managers of conventional businesses may want to consider developing frugal products to create a more inclusive market for their products. Despite remarkable efforts from large businesses, many people still cannot afford conventional products, so businesses could consider developing frugal products to grow their market share in an inclusive manner. Supporting organizations could also reformulate their efforts to support grassroots entrepreneurs in developing frugal solutions to address pressing problems. NGOs, donor organizations and governments could also develop institutions to facilitate the resource mobilization efforts of frugal entrepreneurs. It seems that individuals' technical skills also play a vital role in developing frugal solutions at the grassroots level, and due to the novelty of their products, frugal entrepreneurs face challenges in finding the necessary human resources within their localities. It is therefore important to focus on developing more people with technical skills at the grassroots level. Frugal entrepreneurs also contribute to sustainable development by

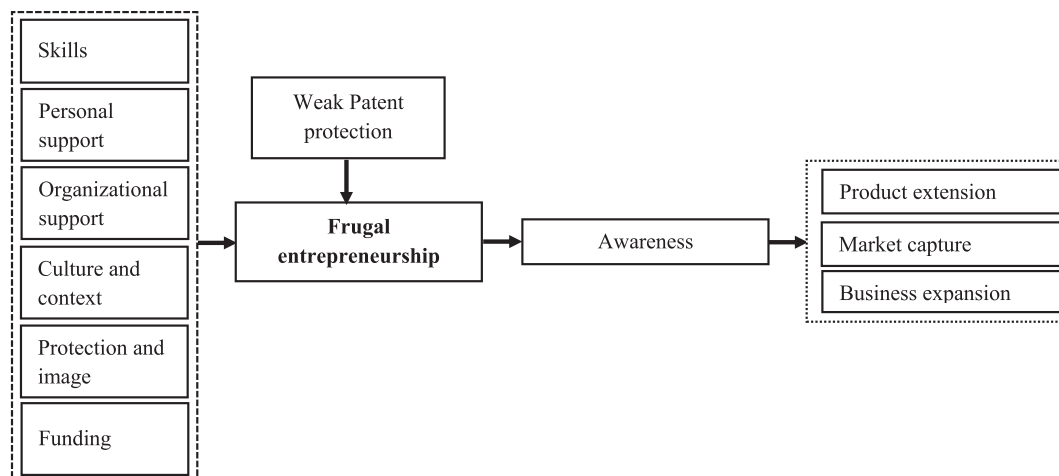


FIGURE 2 A framework of frugal entrepreneurship at the grassroots level in an emerging market

repurposing existing resources and employing used, discarded or locally available resources as raw materials for making frugal products, so other businesses could consider similar activities in their own product development to also contribute to sustainable development, which is not just a United Nations mandate but also a moral responsibility for businesses. Despite having patents, frugal entrepreneurs cannot protect their products from being copied by others, so governments need to develop mechanisms to help frugal entrepreneurs protect their intellectual property rights, which is a key resource for any business. Frugal entrepreneurs consider culture and context very deeply when developing frugal products, so traditional businesses could emulate this to develop products for inclusive growth. With a lack of formal financial institutions for FE, entrepreneurs rely heavily on personal assets, informal moneylenders and friends and family, so the cost of capital for the loan is often very high for them. Hence, supporting organizations could formulate policies for providing grants or loans at low-interest rates with flexible repayment options.

5.3 | Limitations and future research directions

This study has several limitations that may provide future research opportunities. We considered six successful cases from India, but also exploring unsuccessful cases may provide a more balanced understanding of the FE phenomenon. In addition, we need studies from other geographical regions. We also only explored three broad categories of resources, so future research may seek to achieve a more granular understanding of resource mobilization by categorizing resource types differently. Further study is also needed to determine how to develop skilled people, protect patents and understand the context for frugal products. In addition, even though there is micro-venture capital available to support frugal entrepreneurs, such as in India (Sonne, 2012), whether it actually boosts FE remains unexplored. Indeed, we need to develop financing models that enable frugal entrepreneurs to get loans easily and repay them flexibly. Finally, the framework (Figure 2) we developed based on the findings could be tested through future quantitative studies to validate its veracity. Overall, many areas remain underexplored for FE at the grassroots level of emerging markets.

DATA AVAILABILITY STATEMENT

Data can be received from the author up request.

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