Exploring Entrepreneurial Activities in Marginalized Widows: A Case from Rural Sri Lanka

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In some developing countries, widows are looked down upon and are often considered inauspicious especially in rural regions. Some societies even consider them and their issues invisible. This paper presents findings from a qualitative study focused on understanding how technology could facilitate entrepreneurial and DIY activities of widows from rural Sri Lanka. We conducted semi-structured interviews and field observations with thirteen widows from low socio-economic backgrounds, who were involved in various small-scale entrepreneurial activities. Our findings showed three central aspects associated with their entrepreneurial activities which can be supported through technology: initial stages of entrepreneurship, balancing work with life, and dealing with exploitations. This paper explores how gender inequality in a social context affects marginalized women in rural Sri Lanka in conducting their entrepreneurial efforts. In particular, we highlight resilient practices that the participants apply to support their entrepreneurial activities. With an "assets-based approach" we conclude by providing implications for policymakers, media, and HCI practitioners to support this inbuilt resilience by leveraging their current assets. [1]

1 INTRODUCTION

The loss of a partner can be a traumatic experience. However, for many women in developing countries, this devastating loss is amplified due to social and cultural practices as well as patriarchal ancient beliefs. They may get evicted from their own homes, considered inauspicious, and in some cases may be forced into unwanted marriages. Due to these challenges, widows in the developing regions occupy a rather marginalized space, particularly in countries where traditions, rituals, and customs hold a significant value [16]. Statistically, it is estimated that there are around 258 million widows [51] in the world and 1 out of every 10 of them are suffering from extreme poverty [65]. In the Sri Lankan context, it is reported that 12% of the households are run

by widows. This high number is mainly due to the 30-year-long civil war which left more than 89,000 widowed [5]. Unfortunately, several issues and challenges that this group of women faces go unnoticed mainly due to cultural norms. Also, in most cases, their voices are absent when important policy decisions are made impacting them [66]. This lack of opportunities to voice their needs has lead the United Nations to identify these widows as 'invisible women' and highlighted the importance of understanding the unique challenges they experience due to subtle issues [64].

We conducted a three-month-long qualitative study to develop a holistic understanding of the issues, challenges, and experiences of marginalized widows. This is part of a larger project, where we sought to design technological tools to support the entrepreneurial and DIY activities of marginalized widows in rural Sri Lanka. The complete project is designed following the design case study framework [74]. The design case study framework consists of three phases: empirically analyse the practices in the specific field of application, produce an innovative design based on the empirical findings, and investigate the feasibility of the technical artifact over a longer period. This paper presents our findings on the first phase of the design case study framework.

We recruited 13 participants in collaboration with the Small Enterprises Development Division (SEDD) of the Ministry of National Policies and Economic Affairs, Sri Lanka. All our participants were widows and were involved in entrepreneurial activities. We carried out field observations and semi-structured interviews, with the participants throughout a period of three months. Our findings showed a variety of challenges widows face ranging from setting up a new business, balancing work-family lives, and dealing with exploitations in the patriarchal society. We position our findings in the ICTD and feminist Human-Computer Interaction (HCI) [8] literature. We aim to develop a better understanding of the lives of widows and how we can design technologies to both support and empower them. We also highlight the "invisible practices" of this community and how their entrepreneurial activities are supported through resilient practices. Through our findings, we present design implications to support their resilience through design.

We offer two contributions to the CSCW community. First, we provide an empirical account of the resilient practices that marginalized widows apply to establish and manage their entrepreneurial efforts. This work extends the existing CSCW and ICTD studies on women's efforts in the patriarchal society in the global south [2,3,21,27,33,54,62]. Second, from an asset-based design perspective [15,29,73] we urge the Sri Lankan policymakers, media as well as HCI practitioners to explore the current physical assets as well as their culturally specific but often invisible practices to account for when providing solutions. We conclude by suggesting a set of design implications that can support widows in the global south and extend the feminist HCI agenda.

2 BACKGROUND

Sri Lanka is a relatively smaller country (~65000 km^2) with a population of approximately 22 million, situated south of the Indian subcontinent. The hierarchy of the society is mainly patriarchal particularly in rural regions, where according to statistics 77.4% of the population lives. The male's role as the breadwinner and decision-maker is socially and culturally accepted which forces the women to take a back seat when it comes to major decisions. They are expected to manage the household while men earn money.

Furthermore, in Sri Lanka, when a woman gets married, they are expected to leave their parents and live with their husband's family. Many women marry young and often to older men [12,67]. Consequently, widowhood is a common occurrence in these families [72].

This situation is worse in conflict-hit areas due to armed conflicts [46,47,72]. Sri Lanka experienced a 30-year long civil war that resulted in an estimated 89,000 war widows [5]. These women encounter various challenges including poverty due to lack of education or vocational skills [53], discrimination due to ethnicity [31], and gender [19]. A common superstition around widowhood is that the blame of a husband's death is placed on the wife herself, where the death is assumed to be caused by an 'inauspicious wife'. As a result in many cases, the widows are shunned from their husband's family and stigmatized for life by society [61].

Understanding the challenges of the widowed and other women in crisis, the government has established units such as the Small Enterprises Development Division (SEDD) under the Ministry of National Policies and Economic Affairs [42]. Among the aims of these units are to introduce various initiatives to support the reintegration of widowed to society by assisting their entrepreneurial activities.

3 RELATED WORK

3.1 Marginalized women and HCI

In recent times, the field of HCI has shown a greater interest in studying the issues, practices, and experiences of marginalized communities [38,60,69]. Amongst those studies, there is a separate branch that focuses on issues of marginalized women [21,24,35,50,56] and how technology can support them [3,23,56]. With the focus on women and women-specific concerns, researchers have looked at implementing a feminist HCI lens to look further into these aspects [8,9,52]. These lenses help researchers to avoid unintended support of power disparities [52] that exist in local communities as well as to being open to issues in participation [9].

Technology has been depicted as a source of gender empowerment for women [25]. Pal et al, [45] claim that marginalized women employ technology to overcome gendered barriers encountered in institutional and social settings. They particularly relate how women used mobile phones to access educational materials, study support from peers as well as to make connections so that they can find better employment. However, there are also studies on gender disparities in the use of technology as well as access [7]. Based on a 10-month ethnography in slums of Brazil, Nemer [43] reports the gender differences of using ICTs. The researcher highlights how the participating women were sidelined in online gameplay environments as online gameplay was not considered "Feminine" enough. Blumenstock and Eagle [10] state that access to mobile phones varies by gender in Rwanda. They also claim that Rwandan women show different patterns of using phones over men even when they spend similar amounts of time on their phones. This finding is complemented by Mehrotra et al., [41] where they show gendered patterns not only in the use of mobile phones, but over other aspects such as banking, and internet use. Lack of technical knowledge is regarded as the reason for such disparities.

There is a recent interest amongst HCI researchers to explore the assets and resources of these marginalized communities [15,29,73] when designing technological "solutions" for them. This approach recognizes that these communities have well established culturally situated practices that should not be replaced by perusing to implement pre-conceived "idea" of interventions. Overall researchers agree that new technologies designed for these marginalized communities need to support their existing social and cultural structures and practices because that is what shapes the sustainable usage of technology [22,23,39]. Consequently, some researchers also argue that new HCI and ICTD research directions should focus more on the daily requirements of marginalized women instead of focusing on solving complex socioeconomic issues [75].

3.2 Gender and livelihoods

There is an increasing amount of HCI and ICTD work on technology and women empowerment, particularly in the global south where the social structures are predominantly patriarchal [62]. Financial empowerment can be crucial to such women in their attempt to alleviate themselves in a male dominant sociality. Understanding the importance of personal finances to these marginalized women, several of HCI and ICTD work has focused on the use of technology in various low socio-economic settings. For example, initiatives have been taken to offer several microfinancing services to the underbanked communities through Grameen banks [77]. The geographical location, community ethics, beliefs, and local agreements shape the way microfinance institutions issue loans and collect the loan installment back. Collecting loan payments is done by physically visiting the clients weekly or monthly according to a pre-agreed schedule in most of the cases [20,22,40]. Halloluwa et al.,[23] based on their study with rural women in Sri Lanka, report that the use of technology-infused gamified elements had a positive impact on existing local practices and reduced the use of negative practices associated with microfinance such as public shaming [33]. Their study further highlights the importance of embedding mobile money systems within the broader ecosystem of loan repayments. Microfinance loan payment collection of Ghana is not straightforward as it involves multiple levels of receipting and redundant form filling [20]. Even though this seems to be a tedious unnecessary process, it allows them to recover from mistakes and helps in building trust.

Overall, researchers agree that people living in low socio-economical settings possess resilient and resourceful behaviours when handling their day-to-day activities [68]. Ibtsam et al., [27] report the gendered barriers for women in Pakistan and how they are influenced by both socio-cultural and religious contexts. They highlight how the existing gender gap is amplified in these resource-constrained economies and how that impacts women's ability to access and authorize financial transactions. Women were forbidden to go outside the home without a male relative. However, the banks require the participants to visit the institution to open a banking account. Lack of independent mobility prevents the women from visiting the banks even to open a digital banking account which in turn hampers their ability to access financial services. This lack of participation in financial activities and decision making was identified as a barrier between these marginalized women and their economic empowerment.

Thakkar et al. [38] state that education at the bachelors' level in India is gender-balanced, aspects such as marriage and childcare norms, family influence, and finances drove women away from the field at later stages. Studies have shown that mobile phones can be a tool to support gender empowerment for women in various contexts. Hoan et al, [25] show how Vietnamese women living in Singapore used mobile phones to overcome various forms of discrimination in getting access to education as well as employment. The study also highlights how the women used mobile phones to ease the burdens of cultural expectations related to wifehood by accessing online cooking material or using social media to contact elder relatives in Vietnam to get help. Sambasivan et al. [56] how urban sex workers in India used a phone broadcasting system to reach health support as well as getting various payment reminders. As such, mobile phones were found not only a tool for empowering the women in their livelihoods but also as a means of escaping harsh lifestyles by providing them entertainment [49]. This entertainment could vary from chatting with friends to watching movies [49]. However, there are studies that show that the use

of the internet for women is an exception within these marginalized communities [30]. Device sharing with relatives is also identified as a culturally expected practice of women in India, Pakistan, and Bangladesh [54]. In many cases, the women even need permission from husband to log in to social media as they were sharing devices. This can also lead to several privacy and security concerns that are being ignored in these patriarchal societies. One common characteristic of many works is the way researchers access the participants, particularly in the global south. That is by working with NGOs and other similar organizations. Sambasivan et al. [55] report that this is because the access to technology is often mediated in these resource-constrained settings, it becomes easier to access participants through third-party mediators. For example, Kumar and Anderson [37] describe how they used a public health initiative in India to target pregnant women and provide health information via community-created videos [37], Shroff and Kam [58] present a model where they show how a local NGO and women work together to overcome poverty.

3.3 Gender and safety

While there may not be enough prior studies involving widows in CSCW and ICTD literature, we realized that researchers have investigated women in crises in general. Particularly under the umbrella of feminist HCI [8]. Various life events can place a woman in a crisis. Becoming a widow, getting divorced, homelessness and domestic violence are some of those situations (e.g. [13,14,21,71]).

There is a set of studies which report different aspects that lead to women in crises [17,18]. Domestic violence is another major factor for marginalized women to become homeless [81]. Capel et al. [13] advocate the usage of self-reported probes when studying women in crisis as it tends to generate rich insights into their lives. Halloluwa et al. [21] report their methods of using co-design to get Sri Lankan rural women to articulate sensitive experiences such as domestic violence.

Researchers have also explored several technological solutions to support women in crises. Karusala and Kumar [34] have studied the use of a panic button application in a mobile phone with urban women in India that can send the location to emergency contacts. SafeStreet [4], and HarassMap [76] is another similar intervention where the women at risk can broadcast their location or send an emergency message to a nearby relative or even police. Ahmed et al. [3] have presented an application which can help women in Bangladesh to report, map and share their experiences around sexual harassment. The study reports that while the primary goal of this work was to support women concerning sexual harassment on the streets, the women also started to use this to report the several harassments they experience through social media.

However, it is also noted that most of the above mentioned studies on Feminist HCI have a larger focus on issues faced by women, mostly in urban settings where they may also have a significant advantage in terms of educational levels, even in the global south [62]. Additionally, the tools designed for urban areas (e.g. [4,76]) and the lessons learned from studies conducted with participants from urban areas (e.g.[1,3,44,56]) may not be applicable in rural areas where the society is conservative and mostly patriarchal [62]. As such researchers highlight the need to engage with rural women around their experiences and practices at a ground level so that the designs are successful [2,36].

3.4 Widowhood

Widowhood is a devastating experience for women. The term 'widow' is used to refer to not only to married women who lost their husbands. It also refers to unmarried women who had lost their

long term partners [51]. According to the world bank, there are 258 million widows in the world out of which nearly 10% of them live in extreme poverty [64]. Further, it is reported that with the loss of their spouse, the income of the household greatly decreases, more notably with older couples. Studies have shown that this is mainly due to women losing portions of social security benefits with the death of their partners [32]. It is also identified that the possibility of a widow dying within months after the death of a partner is at a higher level [48]. This is known as the "widowhood effect". While it is accepted that there can be health issues for families due to the loss of a partner (e.g. [6,57]), Greenway and Cleark [59] report that there is a correlation between widowhood and children's education.

However, it is notable that while HCI has its roots on women in various crises, researchers agree that there are still many issues specific to widows that remain hidden [26]. The United Nations have recognized this limitation by suggesting that widows as invisible women with invisible problems which require unique support [16,64].

4 OUR STUDY

We conducted a qualitative study for over three months. Individual semi-structured interviews and field observations were used to collect data with 13 participants.

4.1 Demography of participants

In geographical terms, all participants were from rural villages of the Kurunegala district, which is approximately 100 km north of Colombo, the capital of Sri Lanka.   Recruitment   of the participants was limited to the Kurunegala district and to the widows who are registered with the Small Enterprises Division. The majority of the participants were Buddhists. This reflects the typical population in Sri Lanka as well. According to the census of population and housing of Sri Lanka in 2012, out of 1,618,465 individuals, 1,431,632 were practicing Buddhism. This natural distribution indicates Buddhism marks 88% coverage within the district.

The monthly income of the participants ranged from 8000 LKR to 50000 LKR (43 USD to 270 USD). However, there were instances where participants earn even less than that. Many of them did not maintain proper financial records.   As such the authors had to rely on the participants' say so to identify the earnings. There was no proper answer for their earning per month but rough figures with an uncertain voice. While only two of the participants had ownership of a smartphone, all other participants had access to low-cost smartphones owned either by their children or a relative. However, all of them owned a basic mobile phone. The two of the participants who owned smartphones were active in social media such as Facebook and WhatsApp and the other used the phones only for basic use such as voice calls and messages.

Table 1 has the complete details of our participants.

Table 1: Participant details.

Participants (Pseudo Names)	Age	Present business	Living Situation	Work Place	Income/Month
Anoja	32	Grinding mill & weaving reed products	In-laws' home, with son and husband's parents	In-law's home	10,000 – 16,000
Anusha	42	Sewing and clothes repair	Parents' home, with son and her parents	Rented shop	25,000 – 35,000
Sewwandi	39	Mushroom cultivation	Own home, with two kids and her brother	Own home	18,000 – 22,000

Shriyani	33	Sewing (kids garments & Serviettes)	Brother's home, with two kids and brother's family	Brother's home	8000 – 12,000
Thilini	34	Sewing (garments, embroider portraits & tablecloths)	Parents' home, with daughter, sister and her parents	Parents' home	28,000 – 35,000
Dhammika	59	Flowerpot maker	Own home, with son's family	Own home	25,000 – 40,000
Nimalika	42	Snacks (Bites) maker	Own home, with two kids	Own home	18,000 – 30,000
Sumana	53	Mosquito nets and joss sticks producer	Own home, with her mother	Own home	15,000 – 25,000
Swarnalatha	61	Organic food cultivation and small-scale cashew business	Own home, with her son's family	Own home	20,000 – 25,000
Priyangani	57	Selling cashew products	Own home, with son	Own home	25,000 – 35,000
Nanda	54	Dairy culture (Selling milk to a collection centre in her village)	Own home, with son	Own home	15,000 – 20,000
Sheela	48	Runs a plant nursery and a beauty salon	Own home, with daughter	Own home	40,000 – 50,000
Amali	36	Selling kids garments	Sister's home, with two kids and sister's family	Sister's home	25,000 – 35,000

4.2 Interviews

At the recruitment, the potential participants were informed about the study as well as the voluntary nature of participation. Afterward, five participants opted out from a total of 18 candidate participants. As such the participants for this study were 13. When getting the initial consent, it was mentioned that they would not get an immediate financial benefit individually upon participating in this study.

The interviews were structured around the day to day activities of their lives with a special focus given to their entrepreneurial activities. We collaborated with the Small Enterprises Development Division [42] of the Ministry of National Policies and Economic Affairs, that operates under the District Secretariat of Kurunegala to ensure that all the participating widows are from low socio economic backgrounds and participating in small scale business. The interviews were carried out at the homes of participants and in their workplaces according to the convenience of participants.

We ensured that our participants did not feel pressured by the involvement of members from the Small Enterprises Development Division. Participants were briefed about the study where we mentioned the voluntary nature of the work. We highlighted that this research project will not benefit them directly. However, the findings of this work would make their struggles visible to the Sri Lankan government. We also informed that all comments and responses will be treated confidentially, and pseudo names will be used to refer to the participants instead of their real names. Written consents were taken from all the participants before conducting the interviews. The interviews and field observation lasted for about 2 hours per session and on average we spent 4 hours with each participant discussing their experiences and letting them relax by listening to their life story.

We did not video record the conversations. However, we took photographs as needed in some of the participant's workplaces (Example, junk food maker, mushroom producer, organic food cultivation) with consent. All the interviews were audio-recorded except one who did not give her consent (Amali). All interviews recorded using one of the researcher's Huawei Y9 smart mobile phone's audio recording application. Later, the recordings and photo evidence were uploaded into google drive directory which was shared among the researchers for further review. For each participant, there was a separate google drive directory named using the participant's first name inside the main directory. Audio recordings and photo evidence at their workplace were stored in two subdirectories under each participant's directory. The semi structured interviews consist of questions (but are not limited to) around the participants' family members, the specific experiences immediately after the passing of the spouse, their financial situation, their overall entrepreneurial activities, and use of technology.

A team of two female and male researcher from Sri Lanka visited participants in their homes. Most interviews were conducted by the female researchers and the male researcher ensured data collection through notes and audio recording of conversations and by taking photographs of the participants' settings. The interviews were carried out in one of the native languages in Sri Lanka – Sinhala. Later, they were translated and transcribed into English. Thematic analysis was carried out after coding the transcriptions [11]. Each author explored the evidence individually and a cross-analysis was carried out to further strengthen the validity of the findings. Further discussions were used to resolve conflicting interpretations.

5 Findings

Our findings revealed three central aspects associated with our participants' entrepreneurial activities. (1) becoming an entrepreneur (2) balancing work with life, and (3) exploitations. This section discusses several example cases related to those aspects in detail.

5.1 Becoming an entrepreneur

5.1.1 Motivations

For most of our participants, becoming a widow did not just bring out an emotional and personal set of problems. Along with those, it also brought a significant social and economic change in their lives such that they found it difficult to survive. Sumana was a housewife when her husband died. Sumana wanted a better income after her husband died as the sum she received was not sufficient enough to look after her mother. She had some skills in using sewing machines, so she started to make simple mosquito nets that she could sell in her village. In the following, she describes her experience:

"My husband was working in the Sri Lankan Army. I lost him even before we had a child. Since then, I received a small pay due to his loss. After his death, I wanted to stand strong with my source of income. I started sewing mosquito nets using my sister-in-law's sewing machine. Most of the buyers were our villagers."

She moved back to her parents' house after the death of her husband and eventually was able to buy her place. Now at 53, she has created her brand for mosquito net products (Figure 1a).

Another motivation we saw in our participants was the desire to give a better future for their children. Our participants have firsthand experiences of how society looks down on them in the absence of their partner. All our participants showed their desire to not let that affect their

children. Spending time with children rooted as essential and had become a significant part of their lives. They all highlighted the issues they may have encountered if they had to attend a routine job, leaving their children unattended at home.

Dhammika, a domestic worker whose husband used to be a labourer stated that her neighbours have started to avoid her family after the death of her husband. The neighbours believed her to be ill-fated and any encounter with her would cause them the same fate. As a result, she even had to walk to a river 5~6 km away to get water despite having a water supply nearby. Ultimately, she had to leave her village to take a fresh start. However, she also stated that such pitfalls strengthened her character to cope with tough situations without stepping back.

"Earlier I used to work as a domestic worker. But I had to leave my village after my husband died. I knew I would not be able to raise my kids in that village. Everyone would look down upon them. But now since we live far away from all our relatives, I found it difficult to find another similar job. That's why I decided to start my own pottery making business."

In a different example, Thilini used to work as a cashier in a car accessory shop in Malaysia. But after the death of her husband, she had returned home to her family. After returning, she has started to make handicrafts as well as kids' garments and greeting cards (Figure 1b). Staying at home has allowed her to look after her children as well as aging parents.

"My parents did their best to look after my children. But they are getting old now and after some time it became very difficult for them to take care of my children."

Figure 1: (a) Sumana's mosquito nets for different bed sizes, (b) Thilini's handcrafted gift cards.

While Thilini did not have any major worries about her accommodation as she was welcomed by her parents in their house, she had additional caring duties to look after her ailing parents and her daughter. Her passion for creating handcrafted products made it easier for her to support her extended family.

5.1.2 Breaking barriers
The above findings highlighted another important aspect of resilience. The resilience in breaking cultural, social and technological barriers in the process of starting their new businesses.

In rural areas of Sri Lanka, where the social structures are mainly patriarchal, women are expected to be housewives and men are expected to earn money. As a result, many of the rural women lack entrepreneurial skills as well as the know-how to commence trade on their own. In addition to the lack of skills and knowledge, they often struggle to find initial capital as well as

access to raw material. While there are many attempts from the government (e.g. [28,80]) as well as other non-government organizations (e.g.[22,78,79]) to provide training programs, they hardly focus on the invisible social aspects, and challenges at the ground level.

In the case of Nimalika, who never even dreamt of starting a new business before the passing of her husband, had started a catering business where she would sell home-cooked snacks. After many struggles, she had met with a local shop owner and had come to an agreement with him about selling her snacks. But she soon realized that the local shop owner was trying to take advantage of her by bargaining the prices knowing that Nimalika is desperate.

"I didn't know what to do. I sold all the snacks to him for a cheaper price than what we initially agreed so that I would make at least some money. But that taught me a great lesson. He only bargained because he knew I was desperate. I realized that I need to build up my image as a businesswoman, not a desperate widow."

She was unable to get a loan from a nearby bank as she did not have the right kind of documentation. So she asked her parents for a loan. With that money, she rented a small van and purchased an electric scale as well as printed some labels for her snack items. With that van, she had gone around to meet vendors outside her village.

"I acted big even though I did not have anything. I was desperate to sell the snacks and I did not show them to anyone. In the end, I got a good price for my snacks."

At the time of our interview, Nimalika mentioned that she distributed her products to six other shops. She no longer needed to rent a van because due to the popularity of her products, shop owners would come to collect the quantities required from her house. Another such example was from Swarnalatha. Along with her two friends, Swarnalatha formed a group and started cultivating organic vegetables in her garden.

"When we started, there was no sufficient yield to sell. We used buses to carry the yield to town and sell them roadside. But no one trusted our vegetables being organic. Later an agricultural instructor formed a small organic market by gathering organic food farmers. Every Wednesday and Saturday I go there with my yield. Now there is a huge demand for my vegetables. I go there by 6.30 am and items finish before 10.00 am."

Swarnalatha was quite articulate in her activities that during her bus journeys to the organic food market, she would try and sell small packs of cashews to other riders on the bus to make some extra cash.

Anoja, a participant who started her business as a weaver of reed mats, mentioned the hardships of accessing raw materials.

"Reeds usually grow in lakes. I normally go to a lake nearby to collect reeds. But during the dry season, the reeds dry up and need to be collected from a different lake about 50 km from my house. Since I could not leave my son home to collect reeds, I kept on losing customers during the dry season."

Anoja joined a local microfinance group to provide for her family during the dry season. She would take a loan from the microfinance company and then repay once the rainy season starts.

Through the microfinance group, she has got to know other weavers of reed products. This has provided Anoja with a solution to her reed collection issue during the dry season.

> *"Now instead of taking loans, I ask other reed collectors to collect reeds for me as well. I get reeds from them, weave products, and sell. I pay for the reed after the sale with a small interest. So now I do not have to rely on loans or rain to provide for my family."*

Thilini's experience provided a great example of the use of technology to reach a larger audience. She has found out that there is a significant market for her kids' garments in urban areas. Therefore, she taught herself to sew and design kids' garments. She started by drawing her ideas in a book and then moved to create small models from discarded clothes from a nearby clothing store. However, since she lived in a rural village, she had to spend several hours travelling to sell her goods. She had an old smartphone with her and was using social media frequently. She used Facebook groups to market her products to a larger audience. She has access to over 98 Facebook groups, and she uses the online community for marketing and selling her products (Fig 2a). However, she soon realized that online marketing is not that simple as it seemed to be.

> *"I kept getting my goods returned. Most of the time, it is due to mismatches in sizes. I did not know what to do. I was overjoyed when I received an order, but it all comes crashing down when the items are returned."*

Figure 2. (a) Thilini advertising her products on a Facebook group, (b) WhatsApp image sent by Thilini explaining how she would get the dimensions requirements from her clients'.

One of her friends has advised her to send a message to the customers with all the dimensions clearly before she starts stitching. She would also reconfirm using example photos with measurements annotated on them to make sure that her customers have looked and understood her designs (Figure 2b). That way, if there is a mismatch, the customer can ask to rectify mismatches before shipping the item.

> *"Finally, I figured it out. Now I do not travel to the town frequently. I only go to purchase raw material. All the sales are done from home…. I ask for an advance payment before start working on the task. Customers send me the image of the deposit slip through WhatsApp or Facebook.*

> *After completing the work, I inform and send photos and let them review the finished product. After that, they send the photo of the deposit slip for the balance and courier fee. Then I courier the product."*

However, it was interesting to find that though younger participants were open to technological interventions and finding outside markets via technology, the older participants show no interest in such technology. The use of technology for participants such as Swarnalatha and Dhammika was limited to taking a phone call or listening to the radio. They seem reluctant and even impartial to the idea of using technology even after we explained how other participants such as Thilini are using her phone to reach a wider audience.

5.2 Balancing work with life

Our findings showed that the participants engaged in activities that allowed them to work from home which helped them balance childcare, economy, and entrepreneurial activities for a sustainable livelihood.

5.2.1 Childcare and work hours

Home played a dual role in our participants' lives. They used their houses as space for entrepreneurial activities and giving shelter to the family. Out of thirteen, twelve participants used their homes as a place to conduct their business. We realized that being able to take care of their children while conducting their entrepreneurial activities was one of the main reasons for doing this along with other economic reasons. Our participants stated that they tried to conduct activities that they can do at home since it is difficult for them to leave their children alone at home. The entrepreneurial activities they engaged in perfectly reflected this aspect. Most of the work they do are limited to small-scale activities such as sewing, creating artworks, preparing short eats, producing mushrooms, collecting milk from cows and weaving reed-based products. Figure 3 shows example work/resident places from four participants.

Figure 3: (a) Nimalika making snacks at a corner of her house, (b) The weaving machine and the grinding mills stored at Anoja's home, (c) Thilini working on her garments, (d) Sewwandi cultivating her mushrooms at the back of her house.

Another advantage of living and working at the same place was that our participants were able to focus on children's education. Education in Sri Lanka is free for everyone in government-sponsored schools. Further, the quality of education at private schools is considered to be higher than in many government-funded schools. Additionally, more information about the family is needed to be provided to enroll a child in a government school than to a private school. As a result, many of our participants wanted to get their children enrolled in a private school. Amali explained that this was mainly because she does not want her daughter to feel the absence of their father.

> "I did not want to enroll her (daughter) to the village school. There are many processes involved in enrolment where the administration needs information about the father. I am afraid that it would have a negative effect on her."

She hardly manages to pay the school fee through the earnings of her business. But now she must spend more time taking her child to school and must spend several hours per day helping the child with her schoolwork. She stated.

> "I wake up at around 5.00 in the morning. Prepare some food for the day. Get my daughter ready and take her to school. Then I spend the next 5 hours around the school because if I am to come back home and return to pick her up, that would waste more time. So, after school, both of us come back home together. Then I spend time with my daughter since he has only me. I only start working after she goes to sleep."

5.2.2 Family support

From our interviews, it was evident that while society avoided our participants, the immediate families took a greater responsibility in taking care of them. Supports were extended in the form of initial funding to set up their businesses, providing knowledge, and training in various entrepreneurial activities, helping in procuring raw material, looking after children, and helping in selling and distribution of the production.

Due to the absence of her husband, Sewwandi's elder brother has decided to help her start her own business of mushroom cultivation. He even went to the extent of resigning from his job to help his younger sister. At the time Sewwandi was struggling to secure even a small loan from a bank. Since no one would provide a loan to Sewwandi, her brother has obtained a loan himself to purchase a packaging machine. Today, he is helping her in growing mushrooms and distributing the product. According to Sewwandi, the unconditional support from her brother is a great relief for her to improve the business. Anoja has been devastated after the sudden loss of her husband. She stated that at some point she has even considered suicide.

> "I did not know what to do. My husband provided for us and we lived a comfortable life. But after his death, I could not even pay our rent. I don't have a good education and I knew that I will not be able to find a job."

Fortunately, her mother has introduced her to some of the reed-weaving villagers and they have taught Anoja and her mother to weave read-based products. They even help her in purchasing raw materials (reeds) from faraway places in bulk quantities. Anoja's mother now lives with her and helps her in weaving as well as taking care of Anoja's little son. Recently, her brother has

bought her a piece of small-scale grinding machinery and she is planning to start a spices packaging business soon. An emotional Anoja stated,

> *"My son and I are forever grateful for all of them (her family as well as the other reed-weavers) who have done this for us. They did not shun us when we needed them the most. Without them, both of us would have died long ago."*

We also found many instances where the children supported the participants to perform their entrepreneurial activities. Sewwandi said that even though she usually sells her mushrooms to third party vendors, in cases of excess production, she walks into doorsteps for selling the excess with her children. She said,

> *"I walk around the nearby villages. Go to doorsteps selling the excess with my children. They also supported me by carrying mushrooms."*

Even though the children are small, they willingly help their mother in transporting mushrooms. This is a common experience shared by almost all our participants.

5.3 Exploitation

One alarming finding of our research was that most of our participants mentioned that they had experienced various types of exploitation attempts – some sexual in nature. This section explores the way they overcame such obstacles and how they employed different strategies to stand strong against these. However, they only discussed these issues with the female members of our research team. We believe that struggling with invisible issues of this kind act as barriers in their journey of success.

Sewwandi disclosed her story of painful experiences she faced during the early stages of living alone with her two kids.

Figure 4: Sewwandi's shed where she surrounds the place with dried tamarind fruits.

> "You see, I live in a meagre shelter (Figure 4). It used to be worse earlier. Even now we do not have doors. We have clothes separating the rooms and at night we use our table to barricade the entrance. It is only recently that I could afford to apply for electricity. We used to use a small oil lamp during the night."

Our findings revealed that there were many instances where men tried to creep into her house knowing her vulnerable state.

> "I barely slept in those days. I used to keep a knife under my mat during the night. That helped me to feel strong."

After some time one of her friends suggested a tactic to detect such invasions. There were several tamarind trees around where she lived. So, her friend advised her to lay a layer of dried tamarind fruits around her shelter. Hence, if someone walks near her shelter, they will step on the tamarind which would make a crushing sound. This would warn her.

> "When I hear crushing sound (from dried tamarind), I take the knife out and start cursing aloud until I feel safe."

During the time of our interview with her, her younger brother had moved into her house which made it easier for her from a safety point of view. At the end of our interview, she expressed her gratitude towards the female researchers of our team stating;

> "I tried complaining to the authorities, but no one wanted to listen to me. Thank you for listening to me and helping to get my story out."

Thilini has been a victim of sexual exploitation attempt by a person from a bank she obtained a loan from. Due to a sudden illness, she could not complete her orders which affected her loan payments. Subsequently, she had missed several loan instalments. Knowing her vulnerable state, this person suggested her to build a sexual relationship with him. He threatened her that if she does not agree, he would file a case against her in courts as a loan defaulter. This type of coercion continued for 3 to 4 months. However, without his knowledge, Thilini had been recording all the conversations and finally, she decided to act,

> "I called him back and said that it is okay if you want to take me to court. But when you do, I will release all these recordings as well as the messages to the court."

Other participants stated that they too had experienced similar incidents at times. Getting anonymous calls were often considered to be "normal" by these participants. They especially mentioned that they frequently get requests for sexual relationships from people when they try to reach vendors to sell their items or when trying to get approvals for their items.

> "Most of the time we have to work with men when doing our trades. Once we experience such proposals, we face the next meet up with fear and have no confidence in anyone. We are stuck at that point. We cannot expand the business due to these bottlenecks."

6 DISCUSSION

Our findings show how becoming a widow could lead to unexpected economic, social and cultural challenges. We realized that women in these communities are generally economically dependent on their husbands. As a result, they have had close to no experience in earning money and other financial aspects such as monetary planning and financial decision making. Their voices are restricted when it comes to aspects related to finances. This observation complements many other studies conducted within the region (e.g. [21,22,61]) where they have shown that there is a substantially limited involvement of women in the financial decision making of a family. In this context, one would assume that the sudden demise of a husband would be catastrophic in terms of managing a family. On the contrary, our findings show different ways our participants overcame such adversity and navigated through the patriarchal structures of Sri Lankan society. As a result, we structure this discussion around the invisible practices of these women around entrepreneurial activities and how the HCI/CSCW communities, policymakers and designers can address those.

6.1 Resilience in Entrepreneurship

Our findings paint a holistic picture of the invisible practices that are associated with the entrepreneurial activities for Sri Lankan widows. Undoubtedly, the experiences presented in this paper shed light on one prominent theme: resilience.

It was evident that becoming a widow inevitably made our participants vulnerable in the eyes of others. Similar to [61], several of our participants were mistreated, taken advantage of and were approached for sexual favours. Like [26], our findings also show that getting access to finance from banks was not always straightforward for our participants. Some relied on their male family members (e.g. Sewwandi) to indirectly get the loans from a bank, while others approached local microfinancing groups (e.g. Anoja) to get the initial funds to start their businesses. Our participants showed how they navigated through the patriarchal structures to get success in their businesses. The example of Nimalika showed that the local vendor tried to take advantage of her situation by offering her a low price for her products. In response, Nimalika showed great resilience when she went around nearby villages to find new vendors who can give her more respectable price options for her products. Swarnalatha showed that while in the initial stages of her business, she struggled a lot to sell her organic vegetables, by forming a group of other women and persisting on her quest allowed her to sell her organic products in a nearby market. These findings complement the previous work where they have shown how women struggle to overcome the barriers put in place within oppressive social structures (e.g.[27,62]).

Our participants took great care while balancing their family life and business. In a majority of cases, participants chose the type of work that they can easily manage from their homes. This included art and craftwork, sewing, cooking and cultivating plants and food products. Often, they engaged in activities they were familiar with rather than learning completely new activities. Previous work [21] has shown that Sri Lankan women prioritise their children's wellbeing over other domestic activities. In the case of Thilini, we saw an extreme example of family intimacy. Thilini did not want her daughter to go to the local school because she was worried that it may remind her daughter of her father's absence. Hence, she enrolled her in a school from another village. She dropped her daughter to school every day early in the morning and stayed close to her school so that she does not have to walk to school again. After bringing her daughter back home, she would start her work. This showed an extraordinary level of care. Similarly, in Anoja's case, instead of leaving the house to collect reeds from a distant lake during the dry season, she

settled on getting a microfinance loan through which she can buy those reeds. These examples showed how conscious our participants were to be close to their children.

While several HCI studies have looked into the role technologies played in women's lives in the global south [3,4,37,62,63], our study showed that apart from Thilini most other participants did not heavily rely on technology. Thilini showed how using Facebook groups, she was able to market her products. Her use of WhatsApp to exchange measurement information about clothes with her clients also showed a creative way of engaging with technology.

Our work also highlighted the safety aspects of the participants in their current situations. The example of Sewwandi was a testimony of what single women go through in their day to day lives. Laying dried tamarind fruits around her house to create a personal security system and keeping a weapon at arm's length were some examples of how Sewwandi exhibited resilience during her vulnerable situation. It was also worth noting that getting frequent 'missed calls' from potential harassers was a completely normal phenomenon in the participants' lives.

6.2 Supporting Resilience

Our findings lead us to explore policymakers, designers and especially how we as HCI practitioners could harness widows' inbuilt resilience to further empower them. The following section presents such implications focusing on empowering these marginalized widows.

6.2.1 Through Policies and Media

Many of the issues our participants encounter are caused due to how society preserves them. Thilini's experiences of attempted sexual exploitations, Nimalika's experience of bargaining and Anoja having to rely on her brother are all example cases where men did not consider women as their equals. And unfortunately, this mindset is socially accepted in the rural regions of the country.

On one hand, changing such a mindset requires a long-term national policy level solution. The Sri Lankan policymaker could look into solutions that are used in gender-equal countries where they address issues such as gender-equal parental leave policies, recruiting employees policies and many more (see [70] for a suggested list of policies). Measuring how good these are performing is critical for policymakers and higher-level authorities who take the leadership in supporting these communities. This will help in formulating long term plans for supporting them without leaving them aside after initial support. These policy changes would hopefully promote fair and inclusive environments within families which would enable equal participation of women in important financial decision making. Ultimately these changes would help empower women to be independent regardless of their situation which will strengthen them in any crisis should one came to be. As a result, this will also help HCI practitioners to look into solutions that are suitable for all "end-users" instead of exploring gender-biased solutions [8,9].

On the other hand, the media (both mass media and social media) has a major role to play in taking the message of gender equality to the rural communities. There are several governments (such as the SEDD) and non-government institutes which focus on empowering marginalized communities with the knowledge that they require to run their business. However, for the government agencies to reach such a large audience is very difficult. Ideas around forming digital training programs can be constructed. Sharing inspirational stories of women overcoming adversity and how they faced issues related to gender, education, language and social stigma would help empower these rural women as such aspirational figures are difficult to come by

within their social circles. Having such stories shared would help the women to have a role model, someone to look up to.

Another aspect that could be improved through policy and media is informal education. While government bodies such as SEDD [42] provide entrepreneurial knowledge to these women, such initiatives are not well publicized. New policies could be introduced to strengthen such initiatives and make those accessible. Media can play a major role in taking this message across all communities so that all women in crisis (not just widows) could take advantage of such opportunities.

6.2.2 Through Design

As mentioned earlier, there is a recent drive amongst HCI practitioners to explore design for various marginalized communities based on their assets (e.g. [15,73]). Our study allowed us to develop a greater understanding of the assets these women possess, ranging from physical devices to various social practices. This understanding allowed us to develop "ideas" of interventions to leverage these using technology.

Supporting social interactions

We noted that since they are shunned from society (sometimes by their own families), most of these women tried to be isolated or move out of their hometowns hoping for a fresh start. However, we also noted that offline as well as online social networks helping these women to cope up with their misfortunes while reaching new marketplaces for their products. This is a finding which complements previous work on women in various crises [14]. Thilini, as well as Sewwandi, expressed how their friends and colleagues helped them out in tough situations either by giving advice or helping in their entrepreneurial activities. Building on the literature as well as our findings, a social network could be designed specifically for the widows so that they can share experiences that are specific to them. Even creating a group at an existing social media platform to connect these marginalized women could be useful. They can use this as a storytelling platform to share their life stories. This would help them to support one another and empower each other. Their reach could be extended to other women in other crisis situations as well. Sharing their experiences of resilience could empower other women to follow.

When designing such social networks, preserving trust plays an important role. Inherently, we saw that there was a little hesitation in exposing their issues, in the initial stages. This hesitation could be a result of all the hardships they went through on their journey. A participant like Thilini would always think twice when someone is going to help, with the bad experiences she has had in the past. Even if they all are in the same situation if the trust is lost it affects the sustainability of the online platforms.

Extending the reach

The same online platform could be used as a mechanism for them to trade. This could not only be used as a marketplace, but also as a place where they could barter and exchange ideas. For example, Sewwandi, now an expert in mushroom cultivation, could share her earlier struggles of getting into mushroom cultivation as a novice. This firsthand information could be helpful for another woman struggling with her own cultivation. Nimalika can explain how she was able to get a fair price for her snacks by hiding her vulnerabilities. Thilini can explain the initial hardships of making an online sale. Her own process of making an online sale could be worth a fortune for another struggling dressmaker. These are all invisible aspects of these women's experiences which could empower other women in similar situations.

While the above-mentioned solutions would require a smartphone as an asset, our studies showed that elder women preferred to use basic mobile phones. In fact, many of them seem to fear advanced technology. Therefore, it is important to explore how these basic mobile phones could be leveraged to facilitate elder women. An SMS service could be used to periodically push curated, personalized information to each user. This information does not have to be comprehensive. Simply directing the user to find the required information based on a subscribed topic would be useful. For example, sending Swarnalatha (Age 61) or Priyangani (Age 57) information about the trends in current cashew market prices could be useful in planning for future sales. It is also important to provide bilingual support based on user preferences. Getting information about financial service providers is another crucial element of our participants' entrepreneurial activities. As we have identified, since formal banking institutions generally refrain from providing financial services such as loans or insurance to these women, many of them have turned towards other non-regulated financial sources such as microfinance companies. While these companies provide small scale loans, their interest rates could be significantly higher than the banks. Therefore, we must design solutions so that these women could calculate their instalments, as well as interest rates before committing to such a loan. Additionally, supporting them with financing their entrepreneurial activities along with business knowledge is similarly important. Connecting and facilitating their businesses with government or non-government financial institutes would help them resolve such financial difficulties through specifically curated schemes. Design ideas around providing specific financial help could be explored for direct communication with such financial institutes to minimize difficulties.

6.3 Reflections

There are several aspects of this study we consider weak, particularly to the way we have conducted it, had we have addressed, made the contributions stronger. First, we began with eighteen (18) participants; however, only thirteen (13) completed their participation. While the initially opted out participants blamed their busy schedules for opting out, the fact that we wanted to visit them and their families in person would have been major reasoning.

Instead, we could have conducted some of the interviews by phone. It seems likely that at least some of the meetings could have been conducted by phone or over video teleconferencing. We realize that this may present a different set of challenges, mainly around aspects of trust. Particularly, since the experiences of these women have taught them not to trust strangers. This was evident in the physical meetings we had with our participants as well since one of the very first questions they would ask was "what is in it for you?".

Another, relating issue we would like to address is the recruitment of participants. While the SEDD helped recruit participants, our results are limited to the experiences of individuals who have interacted with the SEDD. There may be others who are unaware of the SEDD and the support it provides with a completely different set of entrepreneurial practices.

However, the strength of our study is the age distribution of our participants. Amongst our participants, we had women from a relatively younger age (e.g. Anoja- age 32) to the elderly (e.g. Swarnalatha – age 61). This distribution allowed us to gather a rich set of insights into their entrepreneurial practices mainly in terms of technology use. While we would not attempt to generalize our findings, having a larger number would have helped us conclude with greater validity.

7 CONCLUSIONS

The challenges related to widows remain largely hidden which has led the World Bank to recommend that these women need unique solutions to their problems [29]. We carried out a qualitative study with 13 widowed female participants over three months to understand their day to day practices associated with their entrepreneurial efforts. Our findings show several challenges ranging from starting a new business, balancing work with life to different kinds of exploitations they must encounter. Our findings also highlight the resilience of our participants in dealing with these challenges. Examples of resilience practices showed how they found marketplaces to sell their products, getting support from their families, tactics used to be successful in their trades while managing the household at the same time. It also showed how all their entrepreneurial decisions and activities were influenced by their desire to be a good mother to their children. Their selection of home as a space to conduct their businesses was a good strategy to balance their family needs with business needs. Sometimes they even came up with creative solutions to overcome adversity. We show how HCI can further support these resilient practices to avail positive outcomes for these marginalized women.

ACKNOWLEDGMENTS

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