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Empowerment or employment? Uncovering the paradoxes of social entrepreneurship for women via Husk Power Systems in rural North India

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ABSTRACT

Men continue to dominate the supply-side narratives of energy access projects, leaving an unexplored gap in gendered organizations. To fill this gap, the article utilises interviews with women workers to consider their lived experience working for an energy access-based organisation. Through the use of narrative analysis, this study highlights the importance of socio-cultural contextualisation of social entrepreneurial activities and social missions. It takes a persuasive case-study approach to analysing Husk Power Systems (HPS), which operates primarily in Bihar, India. HPS, a mini grid-based social enterprise, began its operations in Bihar in 2007 with the goal of ameliorating rural Bihar's energy access problems and secondarily, empowering women through employment opportunities. Drawing on the concepts of women's empowerment, social inequalities, and intersectionality, this article argues that although HPS provides formal employment opportunities, its presence has not secured long-lasting women's empowerment in Bihar. As a social enterprise, HPS has limited capacity to reform social inequalities. Although HPS guarantees local job creation, we underscore further exploration of the intersectional dimensions influencing social enterprises' energy access business operations' longevity and impact, including those of local systems of power, caste, gender, and class.

1. Introduction

Gender's importance in energy access projects and programs is widely acknowledged in academic literature [1]. Women are often directly involved in energy poverty alleviation efforts, as social enterprises often attempt to address gender inequalities as Sustainable Development Goals (SDG), in relation to business activities [2]. Still, men continue to dominate the supply-side narratives of energy access projects, leaving an unexplored gap in gendered organizations [3]. In other words, women's supply-side narratives have not been given their deserved attention. Skutsch [4] identified four positive impacts that energy projects and programmes may have on women: improved welfare; economic productivity; empowerment; and project efficiency. Drawing on this, our article focuses on the empowerment of women from a gendered organizational perspective, as it relates to energy access projects. It defines women's empowerment as a means of achieving gender equality, through the three interconnected dimensions of *resources*, *agency*, and *achievements* [5,6]. Empowering work is considered work which provides women a sense of achievement, agency, and resources. This study aims to highlight the importance of socio-cultural

contextualisation of social entrepreneurial activities and social missions, and the use of an intersectional approach involving women's empowerment by taking a persuasive case-study approach to analysing Husk Power Systems (HPS), which operates primarily in Bihar, India. HPS, a mini grid-based social enterprise, began its operations in Bihar in 2007 with the goal of ameliorating rural Bihar's energy access problems. Notably, HPS's mission statement emphasises three social objectives, in addition to rural electrification: women's empowerment, local employment, and rural development. These missions link closely with the energy justice framework, especially energy poverty and representative participation [7].

Some energy access-based social enterprises, such as HPS and Grammen Shakthi, attempt to address gender inequality through women's participation on the supply-side of energy production. Although this paper is not focusing on end-user focused energy justice, we encourage a new dimension of the framework to consider supply-side energy justice. Concisely stated, energy justice is focused on an "energy system that fairly disseminates both the benefits and costs of energy services, and one that has representative and impartial energy decision-making" [7]. On this point, HPS has incorporated circular economy

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principles by utilizing rice husk for gasification and making incense sticks with the resulting tar. In this sense, we acknowledge the strong synergies between the circular economy and SDGs, especially goals 7 and 8, as they focus on energy and inclusive development [8]. Our investigation takes a multi-dimensional approach to analyse women's empowerment efforts undertaken by HPS. To that end, we ground our study on the nexus between the socio-cultural characteristics, social entrepreneurship, and the rural Bottom-of-the-Pyramid (BoP) environment to uncover women's lived experiences and study women's empowerment in rural social energy access enterprise contexts from the supply-side.

Social entrepreneurship, an altruistic variant of entrepreneurial activity, explicitly targets social problems [9] driven by social missions [10]. Herein, social missions, also known as social value propositions, explicitly states desired social change by the project [11]. Globally, more energy access social enterprises have started to address gender through their energy access activities. Traditionally, experts maintain that women's empowerment and sustainable development outcomes are closely related [12]. However, resource-constrained environments limit the scope of that empowerment through public interventions, making just transitions through only government-led policies a challenging terrain. Previous research on the impact of social enterprises operating in the energy access domain has focused on end-user measurements or end-user experiences of electricity access [13–16] in order to assess alleviation of energy poverty. For example, gender and energy studies often consider potential pathways on the demand side to increasing women's economic productivity as a form of empowerment [17–19]. Such studies do not focus on how women employees perceive their work for the social enterprise, nor the extent to which their lives have changed after beginning to work for them. Gray et al. [20] analysed a Tanzanian energy access social enterprise, which hired women exclusively for their solar off-grid service; due to its gender-focused lens, it was successful in promoting equity, even though its focus was not on women's lived experience. Another study analyzed an off-grid solar social enterprise that strategically employed women focusing on social change [21]. To date, few studies assess biomass mini-grids embracing circular economy with a similar social mission, making this case study uniquely useful to businesses offering rural energy access with the goal of facilitating women's empowerment. Our article demonstrates the necessity of taking an intersectional approach to energy access project social missions and their implementation. It hypothesizes the inclusion of contextualizing gender and social inequalities, alongside supply-side narratives, as explicit aspects of energy justice in rural Bottom of Pyramid markets.

Our analysis provides an ethnographic interview-based case study of HPS that employs a narrative analysis of interviews conducted with eight women and 15 men, and two women-only focus groups with five women in each group. The objective of this article is answering the following question: *what effects does an energy access-based social enterprise have on the lived experience of the local workforce, especially in relation to addressing deep-rooted social inequalities, such as gender inequality and high unemployment, through its labour practises?* The article's discussion brings forth considerations of how intersections of gender, empowerment, and employment are articulated in a social entrepreneurial context on a microlevel. We acknowledge there are numerous points of intersectionality such as class, caste, race, patrilocality, and power, but they are not the main focus of this paper. This article underlines an intersectional approach is necessary in order to address social inequalities in energy access projects. Acknowledging the intersections between gender, class, caste, and power, is vital for an energy access social enterprise to have a long-term impact. More broadly, it attempts to supplement, through lived experience interviews, the current understanding of empowerment within boundaries of energy access and entrepreneurial interventions. HPS attempts, through its social mission, to empower women and provide rural employment – but its long-term influence is limited by the socio-cultural contexts in which it functions. Moreover, the article attests to how disregarding socio-cultural

contextualization of women's lived experiences may lead to larger organizational and structural blind spots.

The article is structured in the following manner: section 2 considers the research background and social context and provides a literature review; section 3 describes the methodology undertaken for the study; and section 4 presents the findings. Section 5 provides a discussion and analysis of the interviews.

2. Bihar: Husk power Systems, social entrepreneurship, and gender

HPS operates in the state of Bihar, which is one of the poorest and most under-developed states in India, with a predominantly rural population [22]. Traditionally, Bihar has been a part of the BIMARU (consisting of Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh) states [23], meaning that it is commonly considered one of the most socio-economically underdeveloped states in India [24]. The socio-economic demography of Bihar is characterised by numerous inequality indicators and social inequalities, such as gender inequality, which remains under-addressed in Bihar, on a policy level [25]. Moreover, the underdevelopment of rural areas has resulted in a workforce migration within India [26], as male family members often leave to work in other states. Migration, which we define as the seasonal or long-term movement of individuals for employment, has been a longstanding aspect of life in Bihar. Migration in Bihar may even be considered “not just a livelihood strategy, but a way of life” for the people living there [27]. Desai and Banjeri [28] note that, in India, gender ideologies remain prevalent in communities with absent migrant husbands. In 2011, within the state, rural workforce participation rates were 34% of the total population; with respect to women, it was just 20.2% [29]. More importantly, Bihar's formal workforce participation is one of the lowest in India, indicative of the lack of employment opportunities in rural areas, gender notwithstanding. Although 84 percent of villages in India gained electricity access by 2010, Bihar still has the lowest electrification rate [30], making HPS's entrepreneurial interventions especially welcome.

Taken together, the conditions of rural Bihar resemble a rural BoP environment, which is mainly characterised by market intervention paradoxes [31]. This paradoxical nature is partially the result of institutional voids and limited resources, which themselves constrain commercial entrepreneurial interventions [32]. Mair and Mari [33] argue that social enterprises can “creatively combine resources – resources that often they themselves do not possess – to address a social problem and thereby alter existing social structures”. McKague et al. [34] suggest that the success of interventions relies on the social enterprise's ability to build upon the preexisting social structures of the BoP environment. Previous research indicates that operating in the BoP environment requires new *modus operandi*, through social contracts and non-traditional partnerships [35,36]. Based on a literature review of organizational research, Battilana and Lee [37] conclude that social enterprises are far more effective at balancing economic and social objectives in constrained environments, such as the BoP. In essence, Bihar's rural BoP environment is an opportunity for entrepreneurial interventions that have strong social missions to fill institutional voids left unfulfilled by the state's government.

Social missions are often an integral part of social entrepreneurship, attempting to address social inequalities through business activities [38]. Social missions ensure the balance between commercial and social objectives. The balance may lead to social change while the enterprise attempts to address social inequalities such as energy access and gender. In simple terms, social change facilitates progress and prosperity [38]. Moreover, social entrepreneurship considers social change as one main tenants in the purview of inequalities [39]. From a social change perspective, women's empowerment continues to present a challenge for progress and prosperity, in countries that suffer from gender inequality [40]. In similar settings, social entrepreneurship may play a

role in women's empowerment through organizational practices. In other words, social entrepreneurship has the capacity to empower women by creating environments conducive to addressing inequalities [1,41].

Writing about HPS in a document published 2011, Manoj Sinha (one of the founders of HPS) lists four social missions: electrification, local employment, women's empowerment and rural development [42]. The document foregrounds how women's empowerment features in many of HPS's business practices. Sinha states that "part of the HPS mission statement is to 'empower women'", where the company "places special emphasis on the recruitment and training of local women". In other words, empowerment is perceived as increasing women's labor force participation from organizational view point of HPS. In subsequent company-related news articles, the question of "women's empowerment" is not fully elucidated, reflecting a limited understanding of women's empowerment in that context. Indeed, women empowerment, as a social mission, is especially relevant to Bihar. First, Bihar has some of the highest levels of gender inequality in India based on the UNDP's Gender Inequality Index in terms of women's high maternal mortality rate, early marriage (45% of 20–24 year-olds are married in Bihar, compared to 30% national figures), and low life expectancy (60.4 for women, 62.2 years of men [43]) [44,45], while having to grapple with its numerous political, social, and economic challenges. Given the predominantly patriarchal structure of society in Bihar, most women have limited agency when it comes to important life decisions – such as deciding on family budgets or making electricity access decisions for their households [46]. For those reasons, this article is concerned with the lived experiences of female HPS employees.

At the time of the 2016 interviews, HPS was managing 75 plants, which were providing employment in rural areas – most of those positions supporting the operations of the mini-grid. In addition, by adopting a circular economy, HPS reuses the ash from plant operations to make incense sticks. That incense stick factory employs local women. HPS operates three incense units employing around 120 local women [47]. HPS has created roughly 300 new employment opportunities in rural Bihar in the aforementioned context, besides providing electricity contributing to rural development. Overall, through its business model, it attempts to support the local economy by providing non-agricultural work to meet social missions. Indeed, HPS is arguably an innovator in a challenging context, in its resistance to some norms, routines, and conventions within the realm of social entrepreneurship [48].

The literature review was conducted in two ways: first, we consulted the most recent social science energy research articles concerning gender and energy access to understand the state of the field and current research. Second, we conducted an extensive literature search using Web of Science, SCOPUS, and Google Scholar. Our search criteria was based upon the following key words: "gender", "intersectionality", "women's empowerment", "supply-side", "mini grid", "Bihar, India", "Husk Power Systems", "lived experience", "narratives", AND, "social inequality", "energy access", "energy access projects", "gender inequality". We used multiple combinations of keywords, focusing on articles which considered the supply-side of energy access, as opposed to end-users. Previous literature on HPS focuses largely on business models [49,50], frugal innovation technology [51,52], inclusive business [53], socio-cultural aspects of energy access [54] and policy advice [55]. Despite the integrated nature of the energy access and women's empowerment fields, energy access literature pays little attention to women's lived experiences on supply-side [3,56–59]. Most of the development studies and cultural anthropological literature on women's lives, that we surveyed focuses on the migratory nature and relative poverty of the area, as well as the education levels and cultural tenets in Bihar [26,60,61]. As such, women's empowerment, the lived experiences of women employees, and impact of social entrepreneurship on women's empowerment have been largely overlooked in sustainable development energy business case studies on the supply-side. This presents us with an opportunity to explore the intersectionality between

gender, empowerment, and employment in a context characterized by energy access and social entrepreneurship (see examples of a few related case studies [17,62,63]). Therefore, this paper help address the gap in the supply-side narratives, which often attempt to recount a transformative narrative about the energy access business.

The literature detailing how energy access social enterprises affect lived experiences of women, as mini grid employees in their communities, is sparse. The gender and energy studies by ENERGIA, ESMAP and the World Bank focus, predominantly, on how energy access impacts women's labour and potential pathways to increasing women's economic productivity through women's empowerment frameworks [17–19]. The World Bank study, for example, on Biharian women's empowerment quantifies empowerment in order to assess gender inequalities; it does not incorporate qualitative analyses or solutions to mitigate those inequalities [40]. Presently, one of the main research trends, which Pueyo and Maestre [1] identify, involves analysing whether men and women benefit differently from the Productive Use of Electricity (PUE), in terms of business and economic gains. As such, they note that this literature falls into three broad categories: impact of energy access on women's employment and labour markets; effectiveness of promoting income generation opportunities for women entrepreneurs [64,65]; and impacts of poverty reduction. However, the aforementioned research topics neither focus on the lived experience of employees on the supply-side of energy production nor how energy access businesses attempt to address gender inequalities. More recently, Patnaik and Jha [66] have begun to remedy this gap by considering the intersectional nature of LPG cooking fuel adaption with gender and caste; Winther et al. [57] explores the nexus between gender and electrification through an empowerment framework and energy justice perspective, focusing on the end-user's ability to make decisions about electricity and appliances. Other articles argue that gender equality has been improved with electricity access, as electricity can positively impact women's choices in employment opportunities [67,68]. However, Lee et al. [69] argue that electricity access alone does not guarantee poverty reduction and improved household economic activity (see also Faulkner [70]). One topically relevant article is a socio-cultural anthropological study of working women in a rural Indian fishing village [71], illustrates not only the universality of HPS's issues, but also that such issues are often misconstrued or left unacknowledged, as a result of academic discourse on energy access projects [72]. Liu et al. [73] utilise the Alternative Pathways framework, which focuses on bringing non-mainstream gender narratives concerning energy, to explore how energy projects impact female end-users. Their paper shows the importance of foregrounding minority narratives to explore impacts on end-users. In sum, much of the energy access literature and empowerment studies detailing women's experiences focus on education, entrepreneurship expansion, health, productive uses of energy from end-user perspectives.

Despite the integrated nature of the workplace, most of the literature on energy access and business does not take rural men and women's lived gendered experiences into consideration (see Cannon et al.'s [72] survey on the current limits of gendered approaches to energy research). Most of the sociological and anthropological literature on women's lives that we surveyed focuses on the migratory nature and relative poverty of the area, as well as the education levels and cultural tenets in Bihar [28,28,74]. As such, the gender, lived experiences, and impact of energy access business on women's empowerment have been largely overlooked in sustainable development energy business case studies – presenting us with an opportunity to explore the relationship between and impacts of intersectional social missions and related government policies.

3. Methodology

Women's empowerment is a conceptual term used to describe a process by which societies move towards gender equality, which itself

encompasses women's and men's equal rights, "access to and control over resources and power to influence matters that confirm or affect them" [6]. For this article, empowerment relates to power, inequality, and oppression [75]. The nature of empowerment is "something far more contingent and contextual, and ultimately less predictable", making it difficult to measure [76]. As such, we draw on the work of Kabeer that triangulates three interrelated dimensions of empowerment: *resources*, *agency*, and *achievement* [77]. The triangulation approach is an extension of Sen's capability approach [78] and facilitates a qualitative measure of empowerment. Kabeer's conceptualization of empowerment theorizes resources beyond the conventional economic sense, by including human and social resources within institutional domains such as family, market, and community, in the process of exercising choice. Further, agency "encompasses the meaning, motivation, and purpose which individuals bring to their activity" [5]. In other words, agency is defined as people's ability to influence issues that concern them. Furthermore, achievement measures resultant outcomes with reference to choice of exercised-resources, constraints, opportunities, and agency. Indeed, "achievements" may have "immediate outcomes" (new employment opportunities, electricity access, and less time spent on reproductive labour) and a long-term "social impact", consisting of the potential to access endowments, increased possibility to make strategic life choices, and therefore power relations [79]. In order to measure the achievements of empowerment, qualitative analysis is an informative means of measuring the long-term effects on a local, micro-level [41]. To this end, we use the term "empowering work" to describe work which goes beyond "meeting survival needs" or the "distressed sale of labour" to support Kabeer's work [77]. The above triangulation approach to women's empowerment aligns with Baden and Goett [80] who call for considering the broader economic and social contexts in which women find themselves.

This study applies a persuasive case study approach to explore how narrative theory reveals the intersectionality of social enterprises' social missions. This case study demonstrates how, in its direct efforts to solve rural electrification, HPS indirectly addressed women's empowerment. The study illuminates the importance of understanding socio-cultural constructions which can lead to social change supported by social entrepreneurship and policy-making in order to ensure a more just transition to renewable energy. Further, this study seeks to highlight the complexities social enterprises face when attempting to rectify social issues such as gender inequalities [81]. Although a case study cannot prove a theory on its own, it can illustrate, motivate, and inform researchers about potential next steps to solving a problem [82]. Through a case study approach, our paper aims to address the gaps in social enterprises' social impact measurements of women's empowerment and, more broadly, of gender inequalities. In this article, we define narratives as the stories we tell about our lives and our experiences to construct reality. In applying narrative analysis to business case studies, we utilise Boje's [83] understanding of micro-level organisational narratives as *microhistoria* analysis. *Microhistoria* analysis lends itself to a case study approach because of its micro-level focus on actors and their daily lived experiences, in extrapolating on macro-level trends. Through a micro-level focus, we may consider the reverberations of a macro-level organization on its micro-level employees [83].

Our analysis is based on semi-structured interviews with five members of the HPS management team (all men), along with interviews with eight female HPS employees and 11 male employees. Further, it is based on two focus group (five woman in each focus group) discussions the field researcher and first author conducted with female employees. In addition, the field researchers (consisting of the second author and another researcher) conducted 22 customer and noncustomer interviews, which provide additional background material that is not explicitly cited here. The analysis section draws on the experiences of women, aged between 20 and 40, working for Husk Power System in the villages of Tamkuha and Majhra. The semi-structured interviews consisted of the following questions asked from the female and male employees:

- Why did the women choose to work at HPS or the incense stick factory?
- Are they satisfied with their work?
- What does it mean for them to work for HPS?
- Are they satisfied with the current work?
- How do they use their income?
- How do they see their future?

Ultimately, these questions precipitated different topics of conversation related to women's lived experiences. The field researchers conducted interviews with women explicitly in order to explore their experiences of work and financial capabilities, resulting from the formal employment that is otherwise scarce in rural Bihar. The interviews with men in upper management and in plant operations were the result of gendered employment hierarchies. In relation to context of article, the upper management was asked questions concerning women's recruitment efforts and their perceptions on social challenges related to rural women participation in the company's workforce. One interview was also conducted with the only female plant operator in the field work area.

The field researchers conducted the interviews during a ten-day field trip, in February 2016, in Bihar. The interviews, mostly conducted during working hours, lasted anywhere from 10 min to an hour and 15 min in length, with one of the researchers acting as a translator and with the HR manager (Respondent D) present for some of the interviews. The HR presence is also taken into consideration in our analysis. A conscious effort was made during the interview process to conduct interviews away from the HR manager, in order to ensure that interviewees would narrate their responses authentically. Further, we considered a collection of secondary materials, such as news articles, organizational reports, and videos in addition to the interviews. During the field trip, the research team spent three days at HPS headquarters, conducting interviews over the next seven days. In addition, the research team spent two evenings at Respondent Q's house. During the evenings, respondent Q's mother cooked dinner on a three-stone cook stove, while the research team conducted informally interviews with female family members concerning daily life, energy access, and patriarchy. They used the semi-structured interview format with employees and village customers in order to understand the capabilities fostered and created by HPS. Whilst the focus is on the women's experiences, men's responses are used in juxtaposition in order to illustrate the ways in which structural inequalities of gender and electrification are divergently represented. We translated and transcribed the interviews from Hindi into English. The data analysis consisted of coding the transcribed interviews thematically, to uncover narrative patterns and trends.

There are a number of limitations to the study, which ought to be taken into account. The main limitation was the short field research timetable, which was limited by the constraints of the larger research project and funding. The second limitation is the potential biases and trustworthiness of the narratives provided. Therefore, further longitudinal studies of more villages, with researchers spending time to gain the trust of locals outside of company hours will provide further insights into impacts of employment and daily life. Another limiting factor was the company's insistence of the presence of the HR manager, but it was a stipulation to gain access to interviewees during working hours. The team would often attempt to physically distance the HR manager from interview subjects, while others went to interview employees. Further, the research team member who acted as a translator and interviewer faced problems with understanding the local dialect used by the interviewees. At the beginning of each interview, the interviewee was often more interested in hearing about the background of the main interviewer rather than answering the questions presented. Another problem was that a number of the interviewees, often women, did not always understand the initial interview questions. The translator had to attempt to re-word the questions in order for the interviewee to understand the question being asked. For example, the question

concerning how women saw their future careers, caused some respondents to struggle to understand the concept of ‘future’. One reason for this may be the instability of their futures, which they narrated readily when discussing life in the village: a number of women spoke about losing all their possession in recent floods and landslides in the area, alongside stories of alcoholism and violence. When asked about their future careers, again, many did not narrate having ambitious career goals.

Further, as with all narrative-based studies, the narrator is subject to recall bias and deciding how they wish to represent their lived experiences, potentially leading to retractions, silences, and ambiguities [84]. In addition, interview studies have limited replicability and rely on a relatively small sample size [85]. The interviewer must trust the accuracy of the narrator’s story, and by cross-examination of available primary and secondary data, inaccuracies may be removed or probed further. Notwithstanding the limited sample size and field research, the study provides new perspectives on the production side of energy access projects and how to ensure a more just transition to renewables.

Job title	Gender	Interviewee Identifier
Employee	M	A
Business Development Head	M	B
Head of Operations	M	C
HR Manager	M	D
Technical Head	M	E
Marketing Manager - Incense Sticks Division	M	F
Regional Accounts Manager	M	G
Electrician and Rent Collector - Manjehra plant	M	H
Security Guard - Hybrid plant	M	I
Operation manager - Incense Stick Factory	M	J
Mechanic - Tamkuha region	M	K
Senior Engineer - R&D	M	L
Solar Engineer - Hybrid plant	M	M
Manager - Husk University	M	N
Plant Operator - Manjehara	M	O
HR Assistant	F	P
Incense stick factory supervisor	F	Q
Incense stick factory supervisor	F	R
Incense stick factory worker	F	S
Incense stick factory worker	F	T
Plant Operator	F	U
Incense stick factory worker	F	V
Incense stick factory worker	F	W

Table 1. Information on Interview Participants

4. Findings: Narrative analysis

The following section provides an overview of the managerial level’s concerns with achieving their social mission goal of hiring women, illustrating HPS’s limited ability to fully consider the socio-cultural context of its operations. Next, the next section turns to the women’s lived experiences in order to analyse the impact of HPS’s attempts at women’s empowerment and the results of company interventions.

4.1. Senior management

One of HPS’s main social mission goals is to empower women through employment, either the incense stick factory or as operators for its biomass plant. The narratives of the senior managers stressed the company’s repeated attempts at hiring women for plant operations, reflecting a senior management body that had difficulty hiring women. For example, one common narrative was that the company had initially hoped to hire women for the plant operation, yet was unable to find women to fill those positions. Respondent D narrates, in English, that although HPS first began recruiting women from the local villages, senior management quickly realised that the task was impossible: “We’re trying to hire more lady operators, but it is quite difficult to get lady operator

[even] now in villages” referring to their efforts over the last decade. Instead, HPS found it easier to recruit women for its incense stick factories. In other incense stick factories, preparation is a mechanised process requiring fewer workers. HPS decided to go with a manual process, as Respondent A, the male employee who is in charge of incense stick factories, explains:

But we do not do it [mechanized], because the thought process which we had was to use the existing skill sets of the women folk out there, and get the same prepared, because if we mechanize the whole thing, then instead of 50 women, we will need only five. So, but we do not want to do that. We want to have as many people attached to us in that particular locality or village.

By framing his response in this manner, Respondent A argues that the net positive of HPS is additional income for women and utilitarian job-creation, stemming from the company’s social mission. The Husk Business Developer, Respondent C, explains the decision somewhat differently:

We came up with the incense stick part, and that actually was a like a big thing because in the rural hinterland, there is unemployment, or the lack of employment is a very big concern. So this actually gave employment to the rural woman.

The incense stick factory area manager goes on to say that most women employees do not want to work in nearby towns or perform seasonal jobs. This particular narrative provides a good example of how the company justifies past successes as meeting its social value proposition.

The challenge of finding women who are willing to work as plant operators illustrates how the company narrates failures and fails to achieve its own goals. The HR manager, Respondent D, put framed his narration in the traditional gender role division deterring women from the position: “Because plant operating is little bit difficult, and it’s operated in evening time”, women “have to prepare food, you know, and many things they have to do on [sic] their house”. Other attempts to entice women to work as plant operators have not been successful, as the female villagers “have shown no interest in” this type of work. When asking how the company attempts to employ women to become plant operators by offering them training, Respondent D says: “This [referring to lack of enthusiasm among women] is in spite of providing in house training.” The HR manager discusses recruitment difficulties in the following manner: “So they [women in villages] think we have to leave our house for three months so, you know, the villagers’ mentality is not that they have to live at their house only, and to earn money. They don’t want to go anywhere else.” The Technical Head gave the same narrative, when asked about training more women operators: “they have not shown interest in learning that skill. That is why we have never trained them.” The locals would rather migrate for work than undertake three months’ training. This initial resistance explains HPS’s recruitment drive in the state of Uttar Pradesh, which led to the recruitment of 25 electricians [86]. From the perspective of senior management, the hiring of women for the incense stick factory was one way to uphold the mission of the social enterprise, as they were not able to find women for the plant operator job.

4.2. Female incense stick factory workers

The narratives told by the women, both the plant operators, and the factory workers reveal the underlying socio-cultural structures, traditions, and norms around work and goalsetting. Since the interviews conducted at the incense stick factory were carried out with the company representative present, the interview analysis takes the specific type of narrative performance given by the respondents into account. Women’s responses illustrate how gender roles and norms inform women’s views of their employment at the incense stick factory as transient. Although the incense factory job position gave Respondent Q,

an unmarried woman, the opportunity to earn money, she still expressed dissatisfaction with the work when asked about her future prospects in the incense stick factory. *“I will work till I stay in the village,”* Respondent Q stated, *“Who will do this work after marriage? Who will do this much work after marriage?”* This response shows that although opportunity creation for women gives them the chance to perform work outside the home or seasonal agriculture, cultural and societal customs, alongside the lack of employment opportunities in Bihar, affects women’s decisions and visions of their life in the future. The operational manager of the incense factory, Respondent J, is the workers’ representative and is from an upper caste background. Since she started working there, she has noticed a high worker turnover rate: *“When someone gets married or some workers don’t like to continue working, someone from the same house or other villager will come immediately.”* Respondent J attributes the high turnover to marriage. Unmarried women work at the plant for the short-term until they get married, at which point they will relocate to other villages, based on social norms of patrilocality, meaning women relocate to their husband’s village after marriage. Essentially, there is a high turnover rate at the incense stick factory plant; women’s social positions and traditional gender roles related to childcare and family responsibilities impacts how long they are willing – or even able – to keep a job, just as much as the need for a steady income. Through the interviews, it became readily apparent that social positions impact women’s ability to continue working after marriage: as they move to their in-law’s village, their domestic responsibilities make it impossible to work nights.

One of the main narrative trends deals with how local traditions and norms encourage women to marry – meaning that working before marriage is often a short-term endeavour; yet the training for a plant operator can take up to three months, meaning that even if women are interested, the time commitment detrimentally influences their agency and use of resources. Perhaps to address this cultural tradition of marriage and migration, the incense stick factory training could focus on the output of production rather than on incentivizing and educating women to work as electricians or plant operators. Respondent Q, educated to read and write, complains about the simple nature of work tasks and her reluctance to perform dipping work:

When we started training, we were told to practice dipping work. I informed [last name] sir that I do not want to do dipping work. Give me some other work as I can read and write. Then sir said, we will give you other work as you are literate.

As Respondent Q’s explanation indicates that the women’s training was only focused on the short-term goal of producing incense sticks. Even in operating the power plant, the only female plant operator remarks on her training programme that: *“I went to learn all this and it took 6 months for me to learn. And for 6 months I didn’t get money or labour work from anywhere.”* This example indicates that plant supervisors who are married are more likely to benefit from income generation. Young and educated women, by contrast, do not have many opportunities, as they are expected to migrate from their home village. Yet, despite all of this, HPS advertises on its website that it provides full pay and housing during the men’s training period at their HPS university. This training regimen is more suitable for men, since they can travel to the university, whilst women are more tied to their village and their families.

Another narrative theme is women’s dissatisfaction with their daily wage. Women, who work in the HPS incense stick factories, earn Rs. 70–100 (0,85–1,21 Euro, 2020) a day for their work, depending upon how many sticks they make. During the wet season, women make less and, therefore, earn less. These seasonal fluctuations income is a point of contention for many of the interviewed women, and many factory workers complain about inconsistent wages in their interviews. Respondent W said, *“We told sir [the manager] that we are on strike as we want a minimum daily wage. So sir said, that you will get money as per the work done, it is according to the production.”* Clearly, the women have the

ability to strike, which itself is a means of exercising agency. However, the women do not have joint-bargaining power in order to secure meaningful change, with regards to their wages. This has two main implications: first, that the women’s marginalization means that they do not want variable wages, but rather fixed incomes; second, that there is enough resource uncertainty to prompt women to strike for higher wages. Nevertheless, agricultural work is seasonal in nature, and structurally, women are paid less in India for the same work, which leaves little alternatives than to accept the lower daily wages.

One of the ways in which women save money and exercise their personal agency is by joining a Self-Help Group (SHG). SHGs are informal associations of typically 10–20 women from a similar low socio-strata and socio-economic background, through which women unite to solve a common problem. The incense stick factory women have a SHG that provides them with a social network and feelings of financial inclusion; for example, in the factory, the women reportedly work together like a group, supporting each other in times of financial hardship. The SHG takes a financial risk jointly when helping one of its members. However, the SHG’s saving scheme is only for married women, disadvantaging those who are unmarried.

Interviewer 1 (Male): Is there a scheme of saving Rs. 10 per week for everyone?

Interviewee 2 (Female): It’s not meant for unmarried women.

Interviewee 1 (Female): Sir, unmarried women are not part of this scheme.

Although the saving scheme may prove beneficial to some women, opportunities to join it and benefit from it remain unequal. Based on field observations and discussions with SHG leaders, it appears that unmarried women are unable to join due to social norms and traditional customs. Unmarried women are expected to marry outside of the village; thus, the local SHG would suffer financial consequences, in the case of loan, if a member leaves the village, and therefore is unwilling to take on that risk.

Although women are paid wages, they have little agency in terms of how they use that income, as most of their salaries go towards their family unit, as a whole. In the case of married women, this often means paying school fees for children. Although the money is spent on family, having the opportunity to work is seen as a means of ensuring the family’s long-term survival and future prosperity. Unmarried women gave similar responses, in terms of spending wages on family, except that those wages are given, typically, to the mother, directly. Respondent P, a 23-year-old unmarried part-time worker from an urban background, says the following: *“I’ll give to my mother. She will save it.”* For her, having the opportunity for stable, paid work is important. In addition to working, Respondent P hopes to get a government job once she finishes her studies. Government employment is perceived as a better opportunity in terms of job security and stable income. This struggle to have a steady job to help support family is a difficult endeavour; although there are numerous ways to make small amounts of money, getting a job that pays enough to support a family is difficult, as indicated by the following:

Now also it is very hard. But for a girl if she wants money for her needs only, then it is normal. If she does tuition for classes, then do tuition. We play chess, then if we give tuition of chess to children then it will be over by then. But to run a family it’s very tough. For that, generally it’s not available.

When asked about how they spend their wages, interviewees underline the importance of having a disposable income for family – particularly, women interviewees who want to gain an education, but also feel responsible for providing their families with income. When asked about her future goals, Respondent Q was reluctant to give an answer, as though the question was too personal. She replied, shortly, *“I need a good life.”* When asked what that good life would consist of, Respondent Q had difficulty answering. After some reflection, she gave

this longer answer:

A good life means a happy life. It means a good house and no troubles with family members [referring to her future in-law's house]. If other family members are happy, then I am happy. I do not want financial problems. I had to leave my studies in the middle as my father does not have money.

Her answers are, largely, representative of other women's narratives in the interviews, who also had to stop schooling due to a lack of money to fund their education. The desire to have a good life is a vague concept, with multiple meanings offered when further probed. Although the women interviewed had limited schooling, married women appear to have used their wages to fund their daughters' and sons' educations, as this is viewed as a means of providing a good life for future generations. In the case of unmarried women, a good life is defined as a means of supporting family members. This spending choice suggests that there is a slow shift happening, in social positions, towards providing more equal advanced education opportunities for the younger generation. Cultural values, however, appear to dictate education choices, with better-quality education given, mainly, to sons.

The focus group discussions focus on the type of work that the women performed prior to joining the company. Seven respondents reported that they undertook seasonal agricultural work, while three had not held jobs before HPS. The women in Focus Group A agreed that the "work provides a consistent income compared to daily seasonal work in the fields", and Focus Group B women commented that they preferred HPS work to other jobs in the village, but that the low wages were a cause for concern [41]. One woman commented that the "wage is according to how many sticks we make, but it is better than working in the field." In the second focus group, another woman expressed the same feeling: "Our daily wage is not good on rainy days, but we have to continue working." This response indicates that the woman has preexisting financial burdens that compel her to work. Another point that the group highlights, and that also comes up during the individual interviews, is the women's perceptions of their future: "I am working in this job. My children are studying in school and will get a better job." Another commented, "I feel good about life, as I have the opportunity to earn with the plant". Other women provided similar answers, indicating that having the ability to earn an income was a major driver for working at HPS.

4.3. In the life of a female plant operator

Bihar's rigid social structures make it more difficult for HPS to hire women for their power plant operations, which require workers to be on-call until 10 PM. In the case of current female plant operators, such as Respondent U, many women hires were a lucky happenstance for HPS. Respondent U's interview began in the morning, as her work takes place mostly in the evenings. Her narrative is especially interesting in that it details her feelings as the one of the few female plant operators of the company. Her daily working life is structured around the cultural traditions of Bihar, underlining the tensions between women's empowerment and preexisting social inequalities. Her interview began with the request that she describe an average workday:

I get up in the morning and prepare tea and breakfast for family members. My kids leave by 7 AM in the morning for school then I go to work to do cleaning and husk loading activities. Then they [kids] come back by 12 PM. I return home at 12 PM and then prepare food. I feed the kids and then I go to work around 4 PM again to run the plant.

As the quote illustrates, Respondent U narrates her organizational story: she loads the rice husk in the morning, in order to begin the process; next, she monitors the process, in case any plant maintenance is needed. When asked about the maintenance work and overseeing all of the plant operations, she states:

We come here in the morning. My husband will load the husk. I will clean the plant premises. At 4 PM we test plant operations to check for faults. At

5 PM we start the plant. And then this runs till 12 AM in the night and then after 11 PM when I go home, I feed my children at home.

This response reveals how Respondent U's domestic work is rearranged to accommodate her work schedule. Although both she and her husband both work for HPS, she is on-call for longer hours, as the plant operator. Yet, social norms dictate the rest of her day, with Respondent U framing her story to end at home, with domestic imagery of nurturing children. The expectations placed on her, in terms of her joint responsibilities at the plant and at home, reflect the numerous social inequalities that women in India must face while undertaking empowering employment.

As a plant operator, Respondent U is the only female interviewed who earns a higher wage than her husband. The tensions within the household are palpable, although not stated explicitly. Respondent U presents her husband's perspective in the following manner: "My husband complains sometimes as I earn more than him. I cannot fight, and wish to work hard. I hope my salary will also increase with company progress." This quotation underscores the relationship between gender and paid work, with Respondent U's atypically high wages challenging the traditional correlation, in her household. Because of her higher wages, she says that she has attempted to ask for an increase to her husband's pay. By telling this story, Respondent U demonstrates attempts at mitigating her husband's lowered sense of masculinity and self-worth, by returning to a more socially acceptable wage imbalance.

Overall, senior management's narratives demonstrate the belief that HPS's repeated failed attempts at hiring women for plant operations are attributable to preexisting socio-cultural norms. The women interviewees' narratives touch on different aspects of working at HPS, including the gender identities formed, expressed, and assumed by those women. These narratives reveal ways in which women's earnings and career prospects are limited by patrilocality, or the expectation that a newly married woman will move to her husband's village, following marriage.

5. Discussion

5.1. Plurality of perspectives: women's empowerment, social inequalities, and social entrepreneurship

Narrative analysis reveals that gender inequalities are more deep-rooted than HPS senior management might have expected. This finding corroborates previous research, which shows that the multidimensional positions of women in society are often underplayed in development-based energy access business propositions and operations [87]. The married women who lived in the village and worked for HPS want better compensation for their labour in terms of income and prospects; however, unmarried women employees seem to view HPS as a short-term means of making an income, due to patrilocality. By providing employment opportunities for women, HPS is attempting to carry out its social mission, based on a social value proposition, of increasing women's resources through the provision of a formal income. Electricity intervention, which is another important dimension of HPS's work, is acknowledged – however, senior managements' focus remains on employment and its impacts. In one of the few studies which analyses Indian women's understandings of empowerment, Guérin et al. [88] find that women are "not necessarily looking for autonomy and independence from men, but rather for respect within their own community". In this case study, the results of HPS's employment intervention are varied: from one perspective, working for HPS has the potential to lead to more stable, long-term employment; on the other hand, working at the incense stick factory is seen only as a means of supporting family, until the woman in question gets married.

The daily, lived experience of female workers at HPS reflects how difficult it is to hire women for plant operator jobs: roles which demand more time, education, and flexibility than women in Bihar are often able

to give. This reflects Biharian cultural attitudes towards the work, as well as the practical challenge of finding qualified women to fill technical positions [89]. Typically, married women seem less inclined to invest in their own education or vocational training but prefer to allocate that money for their children's education [90]. When discussing their lived experiences working at HPS, female interviewees noted that there are limited opportunities to use electricity for personal benefit in Bihar. Many rural families are unable to afford electrical appliances, besides their mobile phones. Indeed, as Respondent Q remarks, although her family would enjoy the luxuries of a refrigerator, they are unable to afford it. Ultimately, the products that these women are helping to produce in the factory and through plant operations remain beyond their economic reach.

Although HPS provides women with an income, through paid work, conflicting cultural values have the capacity to dilute women's empowerment at the level of the individual. HPS's mission of empowering women remains vague and ill-defined, and is questionably achieved: certainly, HPS increases women's access to paid work, but the skills that they gain from it do not necessarily enable them to pursue long-lasting professional careers – even as electricity reaches these rural areas [77]. As the interviews reveal, women retain their domestic responsibilities well after entering the work force, such as cooking, cleaning, and raising children. Comparing Respondent U's narrative to that of another male plant engineer without household duties reveals that the man can go home later and is not expected to perform domestic labour. This assessment is supported by Standal and Winther [79] who, in interviews with women from Uttar Pradesh, found that although women solar engineers felt a sense of accomplishment in that role, they still experienced a tradeoff between domestic and waged labour. As our case study illustrates, having disposable income gives women more agency over household expenditures; yet, most of the narratives suggest that, despite women entering the workforce, traditional gender roles dictate household budgeting and spending. Women report that their wages are spent, for the most part, on food, school fees for their children, or their parents. Conversely, unmarried women typically use their additional income to advance their own education or that of members of their families. Men, by contrast, report spending their wages on agriculture, land, and family expenditures. Although, on an individual level, women might feel empowered by working at HPS, at the societal level, HPS's impact on women's empowerment is limited due to patriarchal structural inequalities.

5.2. Intersectionality and organizational narratives

Considering that each of these narratives exists within a broader superstructure – that of preexisting, social inequalities – it is critical to consider the intersectional dimensions of these accounts. Intersectional theory, in short, considers “how gender combines with race, class, sexuality, gender identity and other statuses, in specific geographic and historical contexts” and how those structures of power emerge and interact [91]. Lennon [92] says that there is a paucity of research considering the intersectional dimensions of the energy industry. This need is evidenced by Patnaik and Jha [66], who examine Indian policy in light of how caste, class, and gender influence energy access. In analysing our interview material, it became readily apparent that studying these three indicators, and the manner in which they intersect, could inform how energy access social enterprises seek to reform social structures in order to harness a more just transition to renewable energy. Specifically, we made a number of observations about how energy access-based social enterprises conduct business operations, with respect to how those operations impact employees and end-users. Specifically, illiteracy, lack of formal education, and patrilocality all inhibit well-meaning social enterprises from hiring women into empowering roles. For example, most women expressed their reluctance to temporary relocation to participate in training programs. Moreover, women have limited agency given the patriarchal nature of rural Bihar. For energy

access end-users, these business operations do not eradicate preexisting social inequalities because energy access in-and-of itself is more likely to benefit the next generation of girls, as opposed to present day, rural poor working Indian women.

One of this paper's limitations was in identifying narrative trends that speak to the ways in which caste and class impact energy access social entrepreneurial projects. In Bihar, the higher caste population is smaller than the lower caste population, allowing those from upper castes access to “greater ritual status, economic power, and modern skill and knowledge” [25]. While HPS senior management does touch on its efforts to address caste differences amongst female incense stick factory workers, the women workers themselves were often reluctant to speak about this and avoided answering interview questions about caste directly. Initially, in order to address these structural inequalities, HPS initially opened employment opportunities to all castes and attempted to mitigate social issues through the provision of stable incomes [24]. In contrast to the women interviewees, men would often comment on their place in the caste system, as part of the introductory remarks, without prompting from the interviewer. Both of these responses show how caste and gender are intimately entwined with personal identity; therefore, the social impact of caste is an important consideration [93]. Tapping into these stories and self-representations requires additional, long-term fieldwork, however.

Just transitions and energy justice frameworks mainly emphasize the distribution of goods and services in an ethereal manner. We hypothesize that the production of energy ought to be included into the energy justice model in a more systematic manner. As the case study exemplified, new frameworks as the Alternative Pathways framework, which highlights women's perspectives and non-dominant gender narratives, are potentially useful for exploring the role gender plays in just transitions from an end-user perspective [73]. Justly *produced* energy as well as justly *distributed* energy are important for rural development and poverty alleviation [94], in order for social enterprises to support a more just energy transition. Therefore, by actively using frameworks as the Alternative Pathways framework and Energy Justice frameworks, which include supply-side narratives and employees' lived experiences, businesses and social enterprises can better understand local realities and market restrictions to supply sustainable energy access to alleviate energy poverty.

HPS's interventions do have the capacity to increase the economic resources at a woman's disposal in order for her to make a strategic life choice. In development literature, resource-based empowerment is mainly discussed in terms of a person's “access, ownership, entitlement and control” of land, property, and money [5]. In HPS's case, choosing between seasonal agricultural labour and incense stick factory work shifts towards control over money; however, intersections between caste, class, and gender influence women's actualisation and utilisation of the resources at their disposal. By only hiring women at the incense stick factories and by attempting to hire female operators for the power plant, HPS does enable some women to control their short-term assets, through income. However, it is our assessment that cultivating women's feelings of self-efficacy and hope for long-term change requires support from government institutions and progressive public policies; social enterprises, alone, are less likely to ensure meaningful and lasting social reform [77,95].

Some women respondents perceive that they have control over their everyday decisions, indicating some level of agency: for example, some women might choose to work at the factory if they wanted non-agricultural employment. Still, women's agency remains limited, since respondents do not have the ability to influence matters that affect them personally, such as their salaries, and have limited mobility outside the village into which they were born or married. As Respondent V comments, commuting for work every day is not necessarily the most conducive to skills development. For example, many female respondents cannot commit to training at the Husk University because it the campus is too far away from the village. Yet, without HPS's presence, women

would remain entirely reliant upon seasonal work. On the other hand, working for HPS provides them with a disposable income and some job security. A woman's ability to dictate the course of her life is complicated by gender roles and societal norms, which themselves constrain the types of decisions that she or her husband may make. Patrilocality, in combination with the need to commute for training or for work, make it more difficult for companies like HPS to empower women by hiring them as plant operators, showing how intersectional dimensions ought to factor into company policy.

At HPS, the central distinction between empowerment and employment skill sets illustrates how difficult it is to concretize social value in a rural, resource scarce market. Empowerment and employment are tied to gender identity and entrenched in patriarchy, alongside Bihar's numerous social inequalities [96]. In essence, these issues are complex and require more resources than an energy access company can by themselves provide [97]. In terms of social entrepreneurship energy access businesses, Bihar's social inequalities are visible in terms of employee illiteracy rates, educational gaps, and a lack of technical skills – each of which the organization must address in order to remain viable in the rural BoP market. To mitigate the social inequalities stemming from a lack of formal education, HPS created Husk University, with the idea that workers could attend and gain the requisite skills to work as plant operators. However, employees felt the training away from the village offered diminishing returns, and women, in particular, were less willing to commute to a new location. From an intersectional perspective, Bihar's patriarchal culture and structural inequalities have had a greater long-term detrimental effect on women's mobility and educational opportunities, than on men's.

6. Conclusion

Drawing on the concepts of empowerment, social inequalities, and intersectionality, this article argues that although HPS provides formal employment opportunities, its presence has not secured long-lasting women's empowerment in Bihar. The study shows that through adopting an intersectional approach to energy access and gender issues, the limited ability of social enterprises to enact on deep-rooted social inequalities is revealed. In order to encourage empowering and long-standing social reform, India's government ought to implement just transition policies and programs that support the training and gainful employment of women, at both the state and national levels, and not rely as heavily on social entrepreneurs to fill institutional voids. Moreover, the production side of energy poverty needs to be further included in energy justice frameworks. The energy justice framework does not explicitly consider social inequalities, especially gender equality, as women's participation is the key to addressing energy poverty. Therefore, we propose a furthering of the energy justice framework to include energy supply-side narratives, in addition to focus on the distribution of sustainable renewable energy. In this article, we underscore that there are intersectional dimensions influencing social enterprises' energy access business operations' longevity and impact, including those of local systems of power, caste, gender, and class. The interview material that we examine foregrounds the lived experiences of women working for mini-grid companies, and shows how those lived experiences impact women's conceptions of choice and individual goalsetting; further, our analysis showcases how cultural and societal values colour women's lived experience.

Without multi-level government policy and program changes, alongside a conscious effort by the local community, women's employment prospects and potential for empowerment may not change. As a mini-grid player, HPS has greater potential to reform social inequalities than Solar Home System businesses which encourage individual entrepreneurship because HPS guarantees local job creation. Before HPS began operations in rural Bihar, the paid work opportunities available to women were mostly agricultural, or seasonal, in nature. As respondents suggest, formal employment opportunities are a welcome

prospect, even if the resulting skillset is non-transferable. By analysing the lived experiences of women who took advantage of that employment opportunity, our paper suggests that women in need of an income view the incense stick work as a choiceless choice: in other words, there is no other work that could provide them with a formal income. Traditionally, Bihar is a state in which men migrate for work; however, local workforce recruitment reduces the need for men to migrate to other states. Systems of power and dominance influence men's and women's self-representations in the interviews: caste, class, and religion impact respondents' perceptions of their own life choices. Ultimately, this study underscores how energy access and employment, alone, cannot change these perceptions easily.

The small sample size of female employees, resulting from company and field study time limitations did not allow for a larger sample size. As stated in the discussion, the women respondents were often uncomfortable or unwilling to discuss caste and religion, which limited the analysis of how these important signifiers affected their sense of empowering work. In spite of its limitations, the study adds new knowledge on local level experiences of energy access projects in developing countries and expands our understandings of the energy production side of energy justice. In view of this gap, future research might consider, firstly, how energy access-based social enterprises can systematically address deep-rooted social inequalities in a positive manner to support more just transitions; and, secondly, the degree and type of government intervention required to promote meaningful and long-lasting social reform to energy justice. Social enterprises, in turn, might conceive of and test new ways of empowering women in rural communities through intersectional policies and business models.

As a case study, HPS can teach us about the extent to which energy access businesses with a social purpose can effect social change. Although HPS has had a positive influence on the locals' lives, in terms of stimulating the local economy and providing employment opportunities for women, the company has not taken the complexities of Biharian societal norms and structures into account. While gender inequalities are addressed through formal incomes minimally, those formal incomes do not empower women to the extent that is claimed in the company's mission statement.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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