



Review

Fuelling women's empowerment? An exploration of the linkages between gender, entrepreneurship and access to energy in the informal food sector



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ABSTRACT

This interdisciplinary review paper explores linkages between access to energy, women's empowerment and entrepreneurship. This will be discussed in the context of the informal food sector. Despite expectations that access to energy for productive uses empowers women by enabling them to generate an income, women in developing countries face a range of barriers when establishing and operating enterprises, including access to energy. The literature reviewed in this paper suggests that, although improved access to energy for women in the informal food sector may create a range of benefits for women, the empirical evidence base upon which such claims are made is limited. Access to a range of energy services suitable to their enterprise would provide women with building blocks to operate their enterprise, alleviate restrictions on growth, increase their sustainability, and provide them with increased control over enterprise operation. These may help to create an enabling environment for empowerment, rather than directly contributing to it. Consideration of the gendered dynamics and logics of entrepreneurship in the design of development interventions, in particular with regard to motivations for operating an enterprise, spatial distribution of enterprises, growth strategies and risk behaviour, may lead to more sustainable and empowered enterprises in the long-term.

1. Introduction

Access to sustainable energy for all is a critical challenge for global development and is closely linked to poverty and development [1–4]. Lack of access to energy at home and for income-generating activities is associated with high levels of poverty, low productivity, heavy workloads, and a high exposure to health risks [5]. Women in particular are disproportionately affected by energy poverty, which is defined as the ‘absence of sufficient choice in accessing adequate, affordable, reliable, high quality, safe, and environmentally benign energy services to support economic and human development’ [6]. While affecting the poor in general, energy poverty has a female face [7], as women and girls bear the primary responsibility for collection of firewood, cooking and other domestic work. These tasks expose them to negative health impacts and increases their domestic and reproductive burdens [8–11]. To highlight the severity of the challenge: around 3 billion people still rely on ‘raw’, unconverted, biomass for cooking and heating, which affects health, education and gender equality, and a further 1.5 billion lack access to electricity [12]. Modern energy services (MES), which include energy carriers such as electricity, LPG and petroleum, are

important for stimulating sustainable development and reducing poverty, through providing energy for cooking, heating and cooling, lighting, mechanical power, and mobility [13].

Access to MES is high on the agenda of policy makers, energy practitioners and development agencies, as the United Nations’ Sustainable Development Goals demonstrate [3,14]. However, most efforts so far have prioritised domestic energy access over productive uses of energy, despite evidence suggesting that the latter increases productivity and enables business development, ultimately contributing to improved social and economic outcomes for individuals [2,15]. This effect applies in particular to women, since supporting their economic activity is a key pathway to reducing women's poverty and gender inequality [16,17]. As a consequence, energy access efforts need to evolve from the traditional focus on domestic energy in the family residence to include energy for small-scale production [18]. Systematic data on the impact of such access is urgently needed, as, although the links between energy access, income generation and poverty alleviation are undisputed, most evidence confirming this link is anecdotal and focused on rural areas [19–24].

This paper provides a comprehensive, interdisciplinary review of

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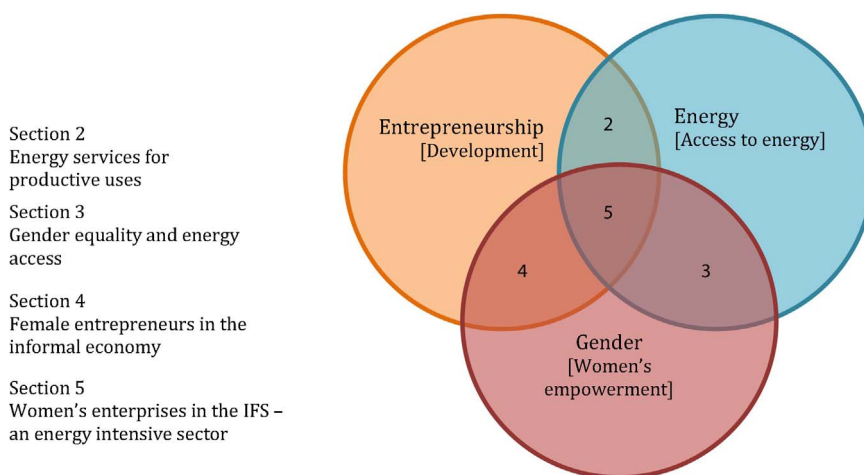


Fig. 1. An interdisciplinary (thematic) review of the literatures on access to energy, women's empowerment and entrepreneurship.

available literature, concentrating on micro-level enterprises that form the bottom layer of economic systems in developing countries. The focus is the informal food sector (IFS), as it is a sector that is both highly dependent on energy and dominated by women. The aim is to highlight what is known about the impact of access to modern energy on small enterprises in this sector, of which the vast majority are found in urban and peri-urban settings. In particular, the discussion focuses on enterprises involving women, and explores the linkages between energy, women's empowerment and entrepreneurship. The structure of the paper is visualised in Fig. 1. It commences with a discussion on how energy access for productive uses is expected to advance development (Section 2.) In Section 3, attention is directed to women's empowerment, whilst exploring the relationship between gender equality and energy. Section 4 engages with the literature on the informal economy, gender and enterprise, whilst Section 5 zooms in to the IFS. The final section highlights what is known and what is not known about the impacts of access to modern energy on small enterprises, establishes the connections between energy, entrepreneurship and women's empowerment in the IFS, and discusses the policy implications of our findings.

2. Access to energy services for productive uses

There is a significant body of literature supporting claims that access to energy advances development, and stimulates to the establishment and growth of enterprises [2,3,15,19,21,25–30]. Energy uses most commonly mentioned in this regard are:

- **Cooking, heating and cooling** [8,10]: It is well known that the majority of households and small enterprises in the developing world rely on traditional fuels (wood, biomass, dung) for their cooking and heating needs, with technology ranging from three-stone open fires, through improved cook stoves, to substantial brick and mortar models [10]. Solid fuels such as wood are mainly used for cooking and heating, whereas transitional fuels (kerosene, charcoal) and modern fuels such as electricity may have cooking and heating as well as cooling applications. For example, the ability to cool products is an important benefit for enterprises in the food sector, as it contributes to reduced food waste and improved quality of products, but also enables entrepreneurs to buy in bulk and refrigerate stock for future use.
- **Lighting**: Electric lighting can increase the total number of productive hours available for enterprises [31–33]. Although traditional light sources such as candles and paraffin lamps can be used, their quality is lower than electrical light. In addition, (street) lighting could provide safety for entrepreneurs and their customers, extend-

ing their work-hours and attract customers. This effect has an important gender component, as studies have documented that provision of street lighting increases women's perceptions of safety [30,32].

- **Mechanical power**: The introduction of mechanical power through modern energy services increases the efficiency and effectiveness of productive activities. Bates et al. [34] and de Gouvello and Durix [35], for example, demonstrated that mechanical services in enterprises have great potential to reduce time spent on fuelwood-gathering, improve air quality, and raise household and community incomes. Mechanical power also contributes to the more informal aspect of incomes by reducing much of daily drudgery that pervades the lives of the poor [30].
- **Mobility**: Often overlooked in discussions of the contribution of modern energy services to poverty alleviation is affordable mobility. Low mobility of the poor stifles the attainment of better living standards, by reducing the ability to earn income and access services such as markets. Options are often constrained by lack of infrastructure, fuel scarcity, distances or time involved with travel and the associated expense [36,37].

The transitions from traditional energy sources to modern energy services are not linear [38–41], but complex [42]. The model of energy ladders assumes a linear transition from traditional biomass fuels to transitional fuels and finally to modern energy services. A key assumption in the model is that, as incomes increase relative to the cost of modern energy carriers, people will always seek to move up the energy ladder, away from traditional fuels towards modern fuels [43–46]. This concept has been criticised, however, for not fully capturing the intricacies of how households and enterprises consume energy [39,40,44], and several studies have contradicted the model. Musango [47], for example, found that, despite increased electrification, households in Gauteng (South Africa) use traditional energy services alongside electricity for economic reasons. Similarly, Akpalu et al. [38] concluded that the concept of energy ladders was not robust as kerosene was the only price-elastic fuel in their sample, whereas the demand for energy carriers, such as wood, charcoal and LPG, was price-inelastic.

Current evidence suggests that, in many cases, even if modern energy services are available, households and enterprises switch back and forth between energy sources, or use them simultaneously. They often remain users of traditional fuels for various reasons, including cost, availability, suitability, and habit, culture and traditions [43,44,48]. However, although traditional biomass fuels are increasingly being embraced as a pillar of low-carbon growth in the developed world [49], in the developing world biomass remains widely viewed as

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