



Finance and the improved cookstove sector in East Africa; Barriers and opportunities for value-chain actors



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ABSTRACT

Despite a long history of diverse approaches designed to increase the adoption of improved cookstoves (ICS), multiple barriers continue to exist which stunt their uptake in many developing countries. This paper focuses specifically on the financial barriers facing actors within the ICS value chain, such as manufacturers, suppliers and distributors. Examining data from interviews with twenty-nine ICS enterprises in Kenya and Uganda, this paper finds that limited access to credit services is a substantial barrier to increasing the capacity of businesses within the ICS value chain. In addition, data from twenty-seven financial providers including banks, micro-finance institutions and savings and credit co-operatives (SACCOs) viewed the ICS market as relatively under-served and believed greater integration could be mutually beneficial. This paper explores the way in which this relationship plays out in current market conditions and how connections between the two sectors can be strengthened, with the objective of overcoming these financial challenges and expanding the capacity of ICS businesses as a mechanism to facilitate ICS uptake by local populations.

1. Introduction

Globally, 2.7 billion people rely on using solid biomass fuels to meet their cooking needs (IEA, 2015), predominantly using traditional cooking methods¹ (Kammen, 1995; Ezzati, 2005). In recent decades, global institutions and international development agencies have worked to promote the sustainable and permanent adoption of improved, cleaner, and more efficient cookstoves to mitigate the health, environmental and climate challenges of development (Sesan, 2014; Perez-Padilla et al., 2010; Jan, 2012; Whitman et al., 2011). Since 2010, this has been spearheaded by the United Nations-led Global Alliance for Clean Cookstoves (GACC) with the aim of reducing the health and environmental impacts associated with using traditional cooking methods (Simon et al., 2014).

However, as is well documented in the literature, the adoption of ICS has been slow in many of the countries they have been promoted in, with low rates of conversion to new technologies (Rehfuess et al., 2014; Ray et al., 2014; Watson et al., 2012; Manibog, 1984). Over time, attempts have been made to understand the factors which interact to

produce this outcome (Barnes et al., 1994), with researchers offering a number of explanations as to the reasons behind sluggish ICS uptake including a broad range of socio-cultural, economic, political and institutional barriers (Jan, 2012; Rehfuess et al., 2014; Levine et al., 2012). Many of the barriers that existed 20 years ago still exist today (Ray et al., 2014) and recent estimates suggest that by 2030, 1.8 billion people will still rely on solid biomass fuels for cooking (IEA, 2016).

Liquidity constraints for consumers in low-income countries have previously been identified as a substantial challenge within the field of poverty reduction (Banerjee, 2001; Winter-Nelson and Temu, 2005). Mobarak et al. (2012) identify the issue of liquidity as a significant factor underpinning the low demand for non-traditional cooking technologies in Bangladesh, while Beltramo et al. (2014) report liquidity constraints as fundamental to the adoption of ICS in Uganda; an issue which could be partly resolved through the availability of time payments (regular fixed payments over time following the adoption of ICS technology). Furthermore, Clough (2012) reports on GVEP (Global Village Energy Partnership)² International's efforts to create linkages and improve access to finance for small and medium-sized ICS

Abbreviations: CB, Commercial Bank; GACC, Global Alliance for Clean Cookstoves; ICS, Improved Cookstove(s); IEA, International Energy Agency; MDI, Microfinance Deposit-taking Institution; MFI, Microfinance Institution; NGO, Non-Governmental Organisation; SACCO, Savings and Community Co-operatives; VSLA, Village Savings and Loan Associations

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¹ Typically, three stone or mud-based cookstoves fuelled by wood, charcoal or animal waste.

² GVEP is now formally known as Energy 4 Impact (E4I).

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businesses in East Africa, identifying the issue of limited credit as a barrier to the growth of such organisations and the subsequent lack of widespread adoption by poor populations.

In this respect, the ICS sector has an opportunity to better integrate with financial providers given the promotion of the financial inclusion movement as a means of reducing poverty by global development agencies over recent decades (Chibba, 2009). This has been predominantly driven by the expansion of the microfinance sector, but also by growth of the mainstream banking industry and increased formalisation of community-based savings and credit groups. These financial institutions have provided greater levels of access to financial products and services for previously excluded, low-income groups across the developing world (Ghate, 2007; Rhyne, 2001; Lapenu and Zeller, 2002). The financial inclusion agenda has attracted considerable criticism, in particular the role and effectiveness of microfinance institutions (MFIs) in poverty reduction strategies (Roy, 2010; Marr, 2012), however the availability of credit services, especially to small and medium-sized enterprises (SMEs), has created new opportunities for the expansion of businesses, contributing to the development of local economies and reducing poverty (Khandker, 2005).

This paper seeks to explore the relationship between these two dynamic sectors, particularly focusing on the role financial providers have in helping to overcome economic barriers which have decelerated the rate of ICS adoption. Focusing on the role of manufacturers, distributors, and retailers, we highlight existing challenges faced by ICS enterprises and the ways in which financial providers can best serve these organisations. Section 2 will explore the context of this research, discussing both the existing ICS and microfinance sectors in Kenya and Uganda while Section 3 provides an explanation of the methodological approach employed. The results of the study are presented in Section 4 and suggest that although many ICS value chain actors are keen to increase engagement with financial institutions as a means of developing their business, these connections remain largely nascent. Financial institutions, while recognising these opportunities and the potential for financial returns, remain cautious in regard to these relationships, often due to fears of illegitimacy and the risk of default amongst such businesses. The paper's originality lies in its investigation of key financial barriers facing actors within the ICS value chain, such as manufacturers, suppliers and distributors, along with identification of the potential mutual benefits that could result from greater integration between ICS producers and financial service providers. These potential co-benefits are poorly understood and our findings are therefore novel as well as having relevance in identifying potential ways of stimulating the expansion of both sectors. In addition to their significance for key sector stakeholders and financial and enterprise-related policy making more general, the findings have relevance for researchers and practitioners working on household energy access, ICS and health as well as environment-related impacts of biomass fuel dependence in low and middle income countries.

2. Background and literature review

The challenge of improving access to clean energy technologies in the global South is well established. Development practitioners have long employed strategies designed to increase the availability of clean energy with mixed results. The centralised service delivery model, in which local and national governments as well as development NGOs have assumed responsibility for the funding and implementation of such programmes, have proved expensive and difficult to organise, while failing to provide a universal level of services (Zerriffi, 2011). Similarly, the strategy of subsidising clean energy projects has produced disappointing results, with, for example, resources being channelled towards particular groups at the expense of the intended recipients (Zerriffi, 2011; Simon et al., 2014). These relative failures have led to the development of new ways of thinking about how the world's poor can efficiently access improved energy technologies.

A number of approaches have sought to utilise the abilities of accessible credit to promote growth in the improved cookstove sector (Rippey, 2012; Zerriffi, 2011). More recently, there has been a focus on market development, with an increasing role on the private sector to share risks and costs (Tigabu et al., 2017; Piebalgs, 2012). These models each vary considerably, focusing on different stakeholders and the creation of alternative credit relationships including, though not limited to, enterprise or business finance, carbon financing and end-user finance (Piebalgs, 2012), with the strengths and limitations of each approach outlined subsequently. The following subsections seek to outline three of the most prominent approaches to using credit as a catalyst for growth in the improved cookstove sector.

2.1. Supply chain financing

An alternate approach to engaging financial institutions in the ICS industry is through extending provision of credit to actors within the ICS supply chain (Rippey, 2012). This strategy consists of financial providers such as commercial banks and microfinance institutions lending directly to manufacturers, distributors, retailers and other businesses. According to Shrimali et al. (2011:7547) “Such ‘enterprise’ financing can help reduce the cost structure of the stove enterprise and enable it to generate positive returns at a lower price point for stoves”. This enables ICS enterprises to provide products which are affordable to end-users at a price point which is sustainable to the business. Enterprise financing can also provide vital funding for the development of a cookstove business, particularly in the early stages of its existence (Shrimali et al., 2011). This form of credit can support “the appreciable up-front time and money spent on customer research, stove design and establishment of a supply channel” (Shrimali et al., 2011:7551), increasing the likelihood of these emerging enterprises achieving economic viability. Gujba et al. (2012) argue that accessing finance from different sources will be key to enabling the development of a low-carbon energy framework, and enterprise finance provides an avenue through which this may be achieved.

However, the effectiveness of this approach to overarching developmental aims has been questioned. Drawing on research in India, Shrimali et al. (2011) report that, even with significant enterprise financing, cookstove businesses have failed to engage with the poorest individuals at the bottom of the economic pyramid. Very low income groups (those earning under \$2 per day) represent a primary target for organisations such as GACC so their absence from the groups benefiting from such programmes is significant. Additionally, Shrimali et al.'s paper on enterprise financing focuses predominantly on finance targeted at new business, with little attention given to the ability of finance to improve and expand existing businesses.

For those established supply chain actors, credit can be used for a variety of purposes, such as purchasing stock, improving manufacturing processes and developing marketing strategies, dependent upon the size and type of business. However, a primary challenge associated with this approach is the identification of businesses which are ready for expansion through these means (Gujba et al., 2012). In community settings, understanding which enterprises are most likely to benefit from accessing finance is difficult for financial institutions to judge due to lack of information and experience. Furthermore, a financial injection in the form of credit in isolation is unlikely to sustain growth if “business and financial technical advisory services are not built into programmes” (Gujba et al., 2012:67). Such initiatives have therefore only demonstrated a limited degree of success and are yet to underpin the rapid scaling-up of ICS production and distribution desired by institutions such as GACC.

A limited number of studies have been conducted on the most efficient ways to develop relationships between financial providers and energy enterprises, though one example can be found in research by Winiacki et al. (2008). This study investigated the ways in which the microfinance and energy sectors could be more successfully and

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