

Association for Information Systems

AIS Electronic Library (AISeL)

UK Academy for Information Systems
Conference Proceedings 2019

UK Academy for Information Systems

Spring 4-10-2019

ICTs and Entrepreneurial Development: A Critical Review Through the Livelihood Lens

Atika Ahmad Kemal

Anglia Ruskin University, atika.kemal@anglia.ac.uk

Follow this and additional works at: <https://aisel.aisnet.org/ukais2019>

Recommended Citation

Kemal, Atika Ahmad, "ICTs and Entrepreneurial Development: A Critical Review Through the Livelihood Lens" (2019). *UK Academy for Information Systems Conference Proceedings 2019*. 3.
<https://aisel.aisnet.org/ukais2019/3>

This material is brought to you by the UK Academy for Information Systems at AIS Electronic Library (AISeL). It has been accepted for inclusion in UK Academy for Information Systems Conference Proceedings 2019 by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

ICTs AND ENTREPRENEURIAL DEVELOPMENT: A CRITICAL REVIEW THROUGH THE LIVELIHOOD LENS

Atika Ahmad Kemal

School of Economics, Business and Law, Anglia Ruskin University, UK

Email: atika.kemal@anglia.ac.uk

Abstract

Whilst the concept of sustainable livelihoods is increasingly central to the debate about rural development, poverty reduction and environmental management, developing economies may not be able to fully utilise the potential of ICTs for entrepreneurial development in its agricultural economies and resource-based industries. The paper reviews the ICT literature through the livelihood lens and seeks to understand how the framework is useful for informal micro-enterprises in contributing to entrepreneurial development as a route to poverty alleviation. Analysing the literature through the framework, the paper highlights that ICTs offer a strategy to achieve sustainable livelihoods by increasing access to a range of livelihood resources, structures and provide institutional linkages, while reducing vulnerabilities and dependence on physical/ natural resources. However, certain organisational, physical and human constraints may restrict the achievement of livelihoods outcomes within a specific context. To conclude, central to the framework, the author proposes how the framework may be extended through the capabilities vision to maximise the benefits that accrue from using ICTs in the informal economic sector.

Keywords: ICTs and entrepreneurial development, livelihoods theory, micro-enterprises, mobile phones, sustainable livelihoods, poverty, developing countries

1.0 Introduction

In recent studies the discourse amongst economists persists whether the focus on economic growth as an economic indicator is passable to reduce poverty in developing countries, or whether it is creating income inequalities. Although economic growth is not a guarantee of poverty reduction, it is believed that it is instrumental for sustaining poverty reduction over the longer term (Morgan, 2017; Bergmann, 2018).

While much heed is being paid towards approaches such as the livelihoods framework for achieving sustainable livelihoods (DFID, 2000), there is little understanding of how Information Communication Technologies (ICTs) can be utilised by the informal economic sector for stimulating micro-entrepreneurial development as a bottom of the pyramid (BoP)

venture. A BoP venture is a revenue generating enterprise that either sells goods to, or sources products from, those at the base of the pyramid in a way that helps to improve the standard of living of the poor (Prahalad and Hammond, 2002; Prahalad and Hart, 2002; Kuriyan et al., 2008). As some studies focus on the strategies that large multinational corporations use to operate at that BoP (Filardi et al., 2018), other studies portray a more complex picture with wide variations in terms of BoP contexts, of BoP initiatives and of impacts of the BOP approach (Antúnez-de-Mayolo, 2012; Kolk et al., 2014). Bottom of the pyramid approaches, such as market de-regulation and privatisation may stimulate the growth of micro-enterprises in developing economies that is regarded as a viable route out of poverty (Duncombe, 2006; Jagun et al., 2008; Prahalad, 2010). Although investments in ICT do not directly lead to poverty alleviation they support pro-poor growth initiatives that lead towards achieving the Sustainable Development Goals (SDGs) (Kenny, 2002; Heeks, 2008; Prahalad, 2010; ITU, 2018). As the bulk of economies in developing nations thrive on micro and small enterprises (MSEs), the role of ICTs to support micro-entrepreneurs for socio-economic development based on the principles of ownership, participation, co-operation, collaboration and capacity-building remains debatable (Duncombe and Heeks, 2005; Chew et al., 2011).

The aim of the paper is to critically review the literature on the use of ICTs by the informal micro-economic sector and frame the concepts under the elements of the livelihoods framework. By exploring some of the central issues surrounding ICTs as a *'process or strategy'* for achieving the livelihood outcomes, the paper attempts to highlight some key issues linking ICTs with sustainable livelihood outcomes. Hence, the paper attempts to advance our understanding and contribute to knowledge related to the theoretical and practical implications of how ICTs may support the livelihood strategy for BoP ventures or micro-enterprises operating in the informal sector of economy in developing countries.

The paper is organised as follows. Section 2 defines 'micro-enterprises' and their classification as livelihood enterprises that is based on the literature. Section 3 highlights the role of ICTs to support the economic activities of micro-enterprises and micro-entrepreneurs operating in the informal sector. In Section 4, I have illustrated the 'livelihoods framework' as a theoretical lens for analysis and Section 5 outlines the methodology for the paper. Section 6 presents the analysis that is framed under the livelihoods framework and finally in

Section 7, I discuss the key arguments, conclude the findings and shed light on the contributions on theory and practice.

2. Micro-Enterprises as Livelihood Enterprises

According to the definition by the European Commission, micro-enterprises employ fewer than 10 employees and have an annual turnover or balance sheet below €2 million. (Economic Commission Act, 2003). In the literature, the term micro-enterprises differs according to regions, countries and contexts with inconsistency based upon attributes; such as number of employees, value of asset owned by the business and the volume of sales generated over a period of time (Frempong, 2009; Makoza and Chigona, 2012).

Micro-enterprises typically operate in the informal rural economic sector where the majority of businesses are unregulated, unlicensed and untaxed (Duncombe and Heeks, 2005; Smelser and Swedberg, 2010). They are also normally underfunded and unregistered to save costs from heavy government regulations that restricts productivity (Duncombe and Heeks, 2005; La Porta and Shleifer, 2008). The most numerous of these enterprises are sole proprietorships characterised by self-employment- often home-based, farm-based or street front businesses that are either temporary, part-time or full-time family-based businesses (Leidholm and Mead, 1999; Donner, 2007; Wolcott, Kamal and Qureshi, 2008). Micro-entrepreneurs operating in the informal sector are typically barbers, village phone ladies, shop owners, farmers, fishermen, fruit and vegetable hawkers, taxi-drivers, maids and tailors majorly run by women (Roldan and Wong, 2008; Makoza and Chigona, 2012).

Some scholars suggest that informal enterprises are more productive than formal micro-enterprises (Esselaar et al., 2007) but are kept from exercising productivity because of unfair taxes, burdensome government regulations. However, if these barriers are eased, they may register to become formal (De Soto, 1989). Other studies report that micro-enterprises stay small and unproductive in order to avoid detection by governments (Farrell, 2004). La Porta and Shleifer (2008) present data from a twenty-seven nation survey of micro-enterprises and argue that the ‘parasite’ nature of informal micro-enterprises undermine economic progress by stealing market share from formal firms. Hence, whether the economic benefits of informality are an impediment or an incentive for increased productivity and growth is

country specific and dependent upon the regulatory and enforcement of laws in the given context (Gelb et al., 2009).

Moreover, micro-enterprises are also categorised as ‘livelihood’ enterprises and are typically survivalists with a short-life span as they are established due to lack of employment opportunities and often abandoned when permanent employment is found (Duncombe and Heeks, 2005; La Porta and Shleifer, 2008). Poor households will generally step in and out of micro-enterprise activity depending upon the nature of the activity, seasonal demand, the availability of resources and personal and social factors (Duncombe and Heeks, 2005; Duncombe, 2007). Other studies argue that the proportion of earnings from micro-enterprises are either non-existent or very low for those in extreme poverty, but tend to increase in a fairly uniform manner for those who are less poor (Shaw, 2004). Hence, for most rural households micro-enterprise is a supplementary activity with the largest proportion of household income still gained from traditional sources; such as wage labour, crop sales and livestock sales (Shaw 2004; Duncombe and Heeks, 2005). Other scholars contend that the poverty reduction potential of livelihood enterprises is large as enterprise income may become part of general household funds and is used for investments in human capital and other substantial expenditure items (Midgley, 2008; Lateh et al., 2017).

Micro-entrepreneurs are critical to the livelihoods of the poor as they arguably create incomes and jobs and are crucial agents of change in the informal economy (Antúnez-de-Mayolo, 2012; Lateh et al., 2017). Other researchers argue that there is less clarity on the extent to which micro-enterprises contribute to economic growth (Berry, Rodriguez and Sandee, 2001; Duncombe, 2007). As the impact of livelihood enterprises on the macro-level seems to be somewhat limited; in terms of wealth creation, growth innovation and value-added exports (Duncombe and Heeks, 2005), at the micro-level there is optimism for the creation of sustainable structures for poverty reduction (Midgley, 2008; Agyapong, 2010). In 2001, the Digital Task Force’s report, ‘Digital Opportunities for All’ (DOT Force, 2001) emphasised the role of enterprises in igniting conditions for sustainable development as it is recognised that local entrepreneurs are much better placed to gauge local demand and general business conditions than those from outside.

However, there is substantial evidence that microenterprises face a myriad of challenges that curtails their growth and survival (Rogerson, 2008; La Porter and Shleifer, 2008). Shortage of resources (informational, financial, physical, natural, social and human), vulnerabilities from the environment (government regulations, taxes, weather, uncertainty of prices, risk), lack of structures (organisational, institutional) and inadequate processes to support micro-entrepreneurs for pro-poor growth activities are some constraints (Wolcott, Kamal and Qureshi, 2008; Makoza and Chigona, 2012). Other scholars argue that ICTs supporting the economic activities of micro-entrepreneurs may help them remain competitive in markets (Goods and Qureshi, 2009; Chew, Ilavarasan and Levy, 2011). Thus, it is critical to investigate how ICTs can be effectively integrated into the livelihoods framework to support micro-entrepreneurs at the BoP.

3.0 Role of ICTS to Support Micro-Enterprises

Information and communication technologies (ICTs) are defined, ‘as an electronic means of capturing, processing, storing and communicating information’ (Duncombe and Heeks, 2005). ICTs using digital information are transmitted over communication networks such as the internet. However, in developing countries, traditional ‘non-digital’ media are more widespread; such as information held as electromagnetic waves, example radio, television and analogue telecommunication networks (Kenny, 2002). Non-digital ICTs also include paper-based technologies such as books, manuals and newspapers, transmitted via written formal means or oral informal means, as held in the human mind as part of ‘indigenous knowledge’ (Duncombe and Heeks, 2005).

Few livelihood micro-entrepreneurs in developing countries have direct access to modern digital ICTs (Duncombe, 2007; Sey and Fellows, 2009). The majority possess traditional ICTs such as radio, with limited access to personal landline telephone and television due to the high costs involved (Kenny, 2002; Duncombe, 2007). Access to landline telephone and television depend upon the remoteness of the micro-enterprise and the local telecommunications and physical infrastructure including roads and electricity (Duncombe and Heeks, 2005; Wolcott, Kamal and Qureshi, 2008). Furthermore, computers and internet usage is also restricted reflecting on the low levels of broadband penetration in rural communities (Moyi, 2003; Donner and Escobari, 2010). Within this context shared access

models, such as telecenters, libraries and internet cafés play an instrumental role in providing access to computers and the internet for communal use (Sey and Fellows, 2009; Wolcott, Kamal and Qureshi, 2008). However mobile phones, with the highest penetration at the BoP in rural communities, are increasingly replacing other ICTs for micro-entrepreneurs (Donner, 2007; Donner and Escobari, 2010; Esselaar et al., 2007; Ilavarasan and Levy, 2012).

In this paper, the term ICT is not only limited to traditional non-digital technologies such as radio, television, and shared communal ICTs (such as public telephones, faxes, computers and internet) in community telecenters, internet cafés and post offices in rural communities, but also mobile phones used by rural communities.

4.0 Livelihoods Framework for Sustainable Outcomes

The sustainable rural livelihoods framework has a number of basic elements (DFID, 2000). The key question in the analysis of literature is:

Given a particular *context* (rural setting, policy, socio-economic conditions) how can ICTs as a *livelihood strategy* provide access to a combination of *livelihood resources* (different types of capital) and with what *outcomes*? The *institutional processes* (combining ICTs with the institutional formal and informal processes) mediate the ability to carry out such strategies and achieve (or not) such outcomes.

The framework is applied at the both the individual (micro-entrepreneur) and institutional (micro-enterprise) level within an informal sector in developing economies. Since micro-enterprises are instrumental in alleviating poverty, it may be argued that the livelihoods theory is a more logical framework to study the impact of ICT on the livelihoods of micro-entrepreneurs. A livelihood is defined as follows,

'A livelihood comprises of assets (natural, physical, human, financial and social), activities, access to these (mediated by institutions and social relations) that together determine the living gained by individuals or households' (Ellis, 2000).

In other words, a livelihood is a means for a living; utilising capabilities and assets to enhance opportunities (Chambers and Conway, 1992; Ellis, 2000) and is sustainable when it can cope with hardships and support a household to continue operating over a period of time (DFID, 2000). Within the context of this study, the framework, the study will analyse how ICTs ‘as a process/ strategy’ becomes meaningful through certain ‘structures’ (micro-enterprises) that access ‘assets’ or ‘capabilities’ (human, social, financial, natural and physical capital) – via ICTs and operate within a ‘vulnerability’ context (environment) to affect certain ‘livelihood outcomes’ (increase in income, productivity, business growth, increase in social capital, improved well-being, restored human dignity and reduced vulnerability). Hence, these livelihood outcomes gain meaning through ‘structures’ that provide support through specific ‘strategies’ (ICT as a process) to achieve the livelihood outcomes. Figure 1 below illustrates the livelihoods framework that is adopted from (DFID, 2000) and applied in this study.

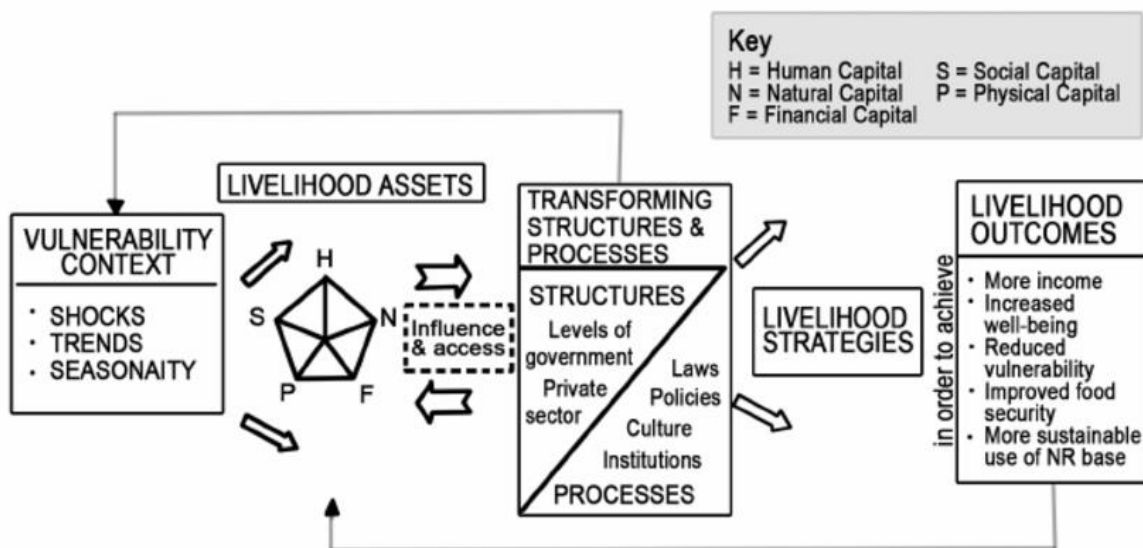


Figure 1. The Livelihoods Framework (DFID, 2000).

5.0 Methodology

This study adopts meta-analysis as a methodology for analysing the literature on ICTs for micro-entrepreneurial development in developing countries. The studies included in the

review were located through a comprehensive search of literature, mostly through manual electronic searches of the following databases: EBSCO, Primo, Google Scholar, SAGE Journal Online, ACM Digital Library, and Elsevier Science. Although search strategies varied depending on the tool used, some common keywords were used: *'ICT and micro-enterprises in developing countries'*, *'ICT usage and micro-entrepreneurial development'*, *'ICTs adoption by micro-entrepreneurs'* and *'ICTs, micro-enterprises and poverty alleviation'*. The search initially yielded over 80 studies that were screened as part of the systemic review process. Finally, around 60 studies were selected for the literature review and purpose of framing the concepts under the livelihoods framework.

Although the literature focussed on ICTs usage within informal micro-enterprises in developing communities, the level of analysis does not distinguish between 'micro-enterprises' and 'micro-entrepreneurs'. In accordance with the working definition for micro-enterprises (presented earlier in the paper), the review conflates both 'micro-enterprises' and 'micro-entrepreneurs' for analysis within the livelihoods framework. Also, it is noted that some authors used the terms micro-small and medium interchangeably in the literature, so with no commonly accepted definitions of the thresholds between micro-small and medium, there were often implicit conceptual overlaps between the acronyms in studies.

Finally, it is noted that the study is limited to the use of traditional ICTs such as mobile phones (excludes smart phones) which justifies its geographical focus on developing nations. This is because although poverty is prevalent in developed nations as well, however, the majority of population still have access to more sophisticated technologies. So besides culture, access and affordability of technology is central to the digital divide between the North and South.

6.0 Analysis through the Livelihoods Framework- ICTs as a Strategic Process/ Strategy

Drawing on reviews of the wider literature on ICT and entrepreneurial development, identifying what livelihood resources (or combinations of 'capitals') are required for different livelihood outcomes is a key step in the process of analysis. Understanding the diversified and unique contexts of how different livelihood resources are sequenced and combined by micro-enterprises/ micro-entrepreneurs in the pursuit of different livelihood strategies is

critical. The livelihood framework is used to map the concepts from the literature: ICTs as a ‘strategic process or ‘strategy’ that increases/ decreases access to capital resources (human, natural, physical, financial and social) for micro-enterprises which operate a vulnerability context (risks/ policies, regulations). Thus, unpacking of these livelihood strategies to examine the connections between such complex and dynamic processes for various ‘livelihood outcomes’ is a key part of the study. Moreover, it is noted that the livelihoods theory integrates different levels of analysis and action between the various actors and structures to illustrate the flow of information between them.

6.1 Increased Financial Assets

Within the livelihoods framework, ICTs are theorised as a ‘strategic process’ to stimulate productivity and business growth of rural micro-entrepreneurs (Duncombe and Heeks, 2005; Duncombe, 2007; Good and Qureshi, 2009). Hence within the livelihoods framework, ICTs increase financial capital and assets for micro-entrepreneurs (Esselaar et al., 2007; Best and Kenny, 2009) through increased revenue.

ICT innovation has enabled banks and microfinance institutes (MFI’s) to extend their outreach to more geographically isolated rural populations - via branchless banking channels that creates accessible, affordable and convenient platforms to deliver microfinance to informal rural micro-enterprises that were once beyond the frontier of formal financial services. As branchless banking provides rural micro-enterprises the choice to use a range of technologies ranging from automated teller machines (ATMs) and mobile banking for instance, these channels provide low-cost access and remittance facilities for micro-enterprises using mobile money (Mas, 2009). However, research indicates that the majority of micro-entrepreneurs fail to survive within their first year, but ICT’s may help them survive by providing them access to credit that is injected back into micro-enterprises for growth and development till they start generating their own profits (Wolcott, Kamal and Qureshi, 2008).

6.2 Increased Access to Information Assets

Research studies denote that ICTs provide key information and communication channels to support the value chain of rural micro-entrepreneurs in the informal economy (Jagun et al., 2008; Good and Qureshi, 2009; Frempong, 2009). Micro-entrepreneurs who cannot afford personal ICTs (telephones, computers, internet) and have restricted access to natural

resources (electricity, roads) use mobile phones to access information on price, buyers and sellers in the local market (Jensen, 2007).

In other cases, the cost of owning a personal telephone exceeds the benefit that arises from its use, therefore, organisations, such as internet cafés, telecenters or a localised business information centre (BIC), act as ‘structures’ to access market information for micro-entrepreneurs. In addition, these ICT structures provide assistance in enhancing individual’s digital skills in order to access information capital (Duncombe, 2007; Roldan and Wong, 2008). Roldan and Wong (2008) cited the example of ‘Cell Bazaar’ - a Grameen Phone service in Bangladesh that makes buying and selling goods over the internet easy for micro-entrepreneurs through Community Information Centres (CICs). The CICs are advantageous as they are in close proximity, are trusted and add value to information delivered to micro-entrepreneurs. Such structures are beneficial to informal micro-enterprises that do not have the money to invest in ICT resources but realise their value to business growth and productivity.

Furthermore, public telephone services and other shared ICTs facilitate the provision of wider choices for micro-entrepreneurs in terms of better prices when dealing with traders (Jagun et al., 2008; Ilavarasan and Levy, 2012). Studies show that micro-entrepreneurs are prepared to travel distances to use telephone services, such as public pay phones and teleshops (Duncombe, 2007) suggesting that they have an urgent need for their information needs. Public telephony plays a supplementary role by providing market information, while simple access to telephone services helps identify market niches to map out competitive behaviour, contact buyers and sellers and arrange transport for buying and selling activities (Kenny, 2002; Moyi, 2003).

Further analysis through the livelihood lens highlights that ICTs support the processes of communication for the poor in relation to supporting information channels for the delivery mechanisms for microfinance and prospects for trade. There is evidence indicating that the more remote the farmer or micro-entrepreneur, the greater the benefit of technology supporting the bottom of the pyramid (Heeks, 2009; Bergmann, 2018).

Also digital ICTs (email and internet) support networks of communication between community based organisations and other support structures through essential delivery

channels (Duncombe, 2007; Good and Qureshi, 2009). While certain info-mediaries are advocates on behalf of the poor and interact more effectively with relevant structures and processes, they must not distance themselves from the poor through the introduction of new ICTs (Duncombe, 2007). However, Heeks (2010) reports that the rapid diffusion of ICTs is an advantage, however it is rapidly being eroded and we should anticipate increasing examples of the type of ICT-enabled ‘disintermediation’ that has been seen in some value chains in the global North.

6.3 Increase in Social Capital

Within the livelihoods framework, ICTs increase ‘social capital’ for micro-entrepreneurs by forging linkages to sources of formalised and better quality market and business networks that strengthen social, cultural and political assets (Duncombe and Heeks, 2005; Duncombe, 2007; Good and Qureshi, 2009). Duncombe and Heeks (2002) in their study of rural micro-entrepreneurs in Botswana argued that micro-entrepreneurs rely heavily on social networks for information on prices, customers and suppliers. Therefore, ICTs play a critical role to build their social capital and by doing so, break the insularity of closed social networks. As a result, it helps micro-entrepreneurs access new markets for increased market share (Donner, 2004, 2006).

6.4 ICTs Create Linkages

Research studies highlight that ICTs enhance market opportunities for rural micro-entrepreneurs by connecting them beyond local informal markets to more formal markets through creating linkages and networks with actors in the value chain (Moyi, 2003; Duncombe, 2007; Good and Qureshi, 2009). ICTs help micro-enterprises establish effective and efficient networks, linking business to other individuals and enterprises across rural boundaries and penetrating into urban markets to enhance market opportunities for buying and selling. Hence, ICTs helps micro-enterprises to capture new markets and expand the customer base (Ilavarasan and Levy, 2012; Kolk, 2014). Consequently, more revenue and income is generated for micro-entrepreneurs that is interpreted as the desired ‘livelihood outcome’. However, within informal rural economies due to infrastructural constraints, such as limited internet penetration and weak mobile signals the development of e-business remains challenging (Chew et al., 2011; Ilahiane, 2012).

Other studies imply that while ICTs help micro-enterprises create institutional linkages with government enterprises and agencies, they may have a contradictory effect on local micro-

entrepreneurs though disempowering them and excluding them from national economic participation (Kleine, 2009). However, it is argued that while institutional linkages- via ICTs connect micro-enterprises to public/private organisations, such partnerships are not trusted by informal livelihood micro-enterprises as they reduce self-reliance and create more dependency on more powerful state actors (Duncombe, 2007; Kleine, 2009).

As stated earlier, ICTs connect micro-entrepreneurs to MFIs, mobile operators and banking agents through viable ‘institutional linkages’ to support their economic activities in delivering micro-finance to smaller businesses (Habib, 2012; Kauffman and Riggins, 2012). Under branchless banking, MFIs partner with agents and retailers to make financial services available to remote clientele, such as micro-entrepreneurs operating in the informal rural sector. This extensive network of banking and retail agents in geographically remote areas act as ‘intermediary linkages’ – linking micro-entrepreneurs with the financial provider or mobile operator to access mobile money. Such mobile banking models are increasingly popular in Africa and Asia (Heeks et al., 2014).

6.5 Reduction in the Vulnerability Context

Analysing through the livelihoods framework, the role of ‘structures’ or communal-based ICT models such as telecenters play a vital role in reducing risks for micro-entrepreneurs. By providing information on local micro-finance providers in the community, credit-rates and loan repayment facilities, ICTs reduce ‘vulnerabilities’ by mitigating risk. Moreover, the Grameen Village Phone Model in Bangladesh, hailed as the architect of micro-finance, is an innovative model of ICT based economic development that is widely promoted by international agencies to provide communal micro-loans to rural micro-entrepreneurs (Boettiger et al., 2012; Habib, 2012). Also, Bruton et al. (2011) illustrate how micro-lending, a group-based lending process, plays a central role in reducing ‘vulnerabilities’ and supporting and monitoring member’s efforts to repay their individual loans. Each group has a leader who meets up with the borrowers and collects the loan. As the repayment process is structured and predictable, ICTs play a significant role for the borrowers in the group by providing communication channels between members of the group and group leader (Bruton et al., 2011; Habib, 2012). Furthermore, communal ICTs in post offices or local booths enable micro-entrepreneurs to connect with loan providers through informal communication channels (Boettiger et al., 2012).

Within the livelihoods theory framework, the institutional, organisational and regulatory factors are critical to influence the economic 'context' for micro-entrepreneurs (Duncombe, 2007; Makoza and Chigona, 2012). With the introduction of branchless banking regulations, the rapid influx of mobile technologies creates a shift from the group lending model towards more individual-based lending, as the Village Phone model is becoming obsolete in some rural economies (Boettiger, et al., 2012).

Other traditional ICTs, such as the community radio and newspaper, are still regarded as the most popular channel in disseminating information to the rural poor – being the cheapest form of mass media. It is further noted that radio signals penetrate into geographically remote regions in rural areas that provide access to critical information for reducing risks (Kenny, 2002; Duncombe and Heeks, 2005). While providing region specific information in local languages, relating to local weather and local policies, these non-digital ICTs incorporate local concerns for rural entrepreneurs (Duncombe and Heeks, 2005; Duncombe, 2007). Critical weather data forms part of an early warning system that protects farmers against natural disasters in order to take timely and necessary precautionary measures for reducing environmental vulnerabilities. Also, information on improved seeds, livestock methods and new technologies helps increase productivity for the agricultural community (Duncombe and Heeks, 2005; Duncombe, 2007; Ilavarasan and Levy, 2012). Through the lens of the livelihoods framework, ICTs decrease vulnerabilities in the environment by providing accurate and timely information to reduce uncertainty factors and risks for micro-entrepreneurs.

Hence, it is argued that ICTs enable micro-entrepreneurs to survive in bigger economic markets by helping them access information on government policies, guidelines, regulations and taxes. In this respect, ICTs enable micro-entrepreneurs to articulate themselves so that they are able to influence and press government and other powerful organisations to implement favourable policies to reduce their vulnerability context (Duncombe, 2007; Filardi et al., 2018). However, Kleine (2009) criticises that while e-procurement is becoming popular, transparency between transactions provide more procurement choices to Chilean micro-entrepreneurs. This strengthens the bargaining power of larger actors in market economies, thereby, creating more inequality in markets that increases vulnerability for smaller micro-entrepreneurs.

6.6 Less Reliance on Physical/ Natural Assets

The literature signifies that ICTs have the potential to reduce the transaction costs associated with the exchange of information relevant to micro-entrepreneurial activity (Good and Qureshi, 2009). ICTs, such as mobile phones, can reduce the time and hence cost of a journey associated with market information, such as selling and buying prices (Jensen, 2007; Jagun et al., 2008). Moreover, the reliance on natural resources such as roads and transport is reduced as ICTs can eliminate the need for travel, hence reducing administrative costs for micro-entrepreneurs residing in rural communities. Hence, within the livelihoods framework, it is argued that there is less reliance on physical resources and Heeks (2009) reports that evolving web 2.0 technologies will displace ‘intermediary bodies’ in the value chain, hence reducing transaction costs for rural entrepreneurs.

7.0 Discussion and Conclusion

The paper concludes that ICTs offer a strategy to achieve sustainable livelihoods by increasing access to a range of livelihood resources, structures and creating institutional linkages, while reducing vulnerabilities in the context and dependence on physical and natural resources. Some livelihood outcomes that are presented in the study for micro-enterprises are; increase in revenue and profits, access to new markets; enhanced market opportunities, access to market prices and information, less reliance on physical/ natural resources and reduction in risks. However, other organisational, ICT infrastructural and human constraints may restrict the expansion of livelihoods outcomes within the context of the informal livelihoods micro-economic sector.

The paper reinforces the discourse that micro-enterprises operating in rural areas have limited access to the ICT infrastructure as poor internet penetration limits access to information, communication and resources. This is accompanied by lack of the enterprises investment in human capital or digital skills and knowledge in creating a digital workforce to engage in business activities (Wolcott et al., 2008; Makoza and Chigona, 2012). Hence, it is argued that ICTs will bring marginal benefits for micro-enterprises, unless they are applied to strengthen a broader range of human or capability assets in addition to building more effective structures and processes that favour rural micro-entrepreneurs and informal micro-enterprises. Thus, it is emphasised how certain organisational, physical and human constraints may restrict the achievement of livelihoods outcomes within a specific context. Hence, it is proposed that

ICTs coupled with Sen's capabilities vision (1999, 2010) may offer alternative approaches to study how 'freedoms' can be achieved for sustainable livelihoods through building human and financial capital and mitigate vulnerabilities for micro-enterprises, especially for those embracing branchless banking channels.

The paper hence contributes to the theoretical literature by extending the livelihoods framework through the capabilities vision. Also, it reinforces the value of building physical and human capacities for 'livelihood' micro-enterprises that are already susceptible to environmental shocks such as inflation. On a practical level, it extends the understanding for micro-enterprises and micro-entrepreneurs related to the benefits from using traditional or digital ICTs to reinforce their business activities and channels for maximising growth and productivity as a livelihood outcome.

Furthermore, some authors criticise the sustainable livelihoods approach for having limited links to information and ICT because of the multiplicity of independent and dependent variables (Parkinson and Ramirez, 2006). The livelihood framework is primarily used by the development community as a tool of analysis to formulate poverty reducing strategies for individuals or households. Hence, the framework may not be appropriate to analyse business units such as micro-enterprises that afford a different definition to sustainable outcomes, as it was originally developed for analysing farmers within the agricultural sector. Also, in the case of applying the livelihoods theory to micro-enterprises, though it recognises the importance of ICTs in establishing linkages with public/ private organisations and other regulatory bodies, it dismisses how such partnerships may interfere with the local developmental agenda for rural micro-entrepreneurs. Finally, the use of social media by rural micro-entrepreneurs although is becoming popular in the north, poor communities in the global south are still struggling to close this widening digital gap.

Notwithstanding, according to neoliberal thinking (Kleine, 2009), efforts to 'tidy up' the market or re-structure that is necessary for long term competitiveness weakens local micro-economies in remote locations and leads to regional inequalities. Further, the micro-macro linkages of economic actors with government bodies ignores the political economic context of governments, and efforts to embrace neo-liberal globalisation for socio-economic development may clash with local micro-economies. However, there is criticism that packaging an economic ideology into a seemingly neutral technology, reduces micro-entrepreneurs choices to decide collectively on the context or guidelines, and reduces their

freedom to choose the life they value. This clashes with Sen's approach, so it is critical that collective choices be arrived through a political participative process and not be pre-empted by technology changes that reduce choice (Kleine, 2009).

References

- Antúnez-de-Mayolo. C. (2012). *The Role of Innovation at the Bottom of the Pyramid in Latin America: Eight Case Studies*. Procedia- Social and Behavioral Sciences, Volume 40, pp- 134- 140.
- Agyapong, D. (2010). *Micro, small and medium enterprises' activities, income level and poverty reduction in Ghana—A synthesis of related literature*. International Journal of E-Business Management, 5(12), 196.
- Bergmann, D. (2018). *Does Economic Growth Help or Hinder Poverty Alleviation? A Case Study from Mexico*. Chicago Policy Review. Available at: <http://chicagopolicyreview.org/2018/03/06/does-economic-growth-help-or-hinder-poverty-alleviation-a-case-study-from-mexico/>
- Berry, A., Rodriguez, E. and Sandee, H. (2001). *Small and Medium Enterprise Dynamics in Indonesia*. Bulletin of Indonesian Economic Studies, 37 (3), pp.363-384.
- Best, M. and Kenny, C. (2009). *ICTs, Enterprise and Development*. In: T.Unwin, ed. *ICT4D: Information and Communication Technology for Development*. Unwin, T., ed. 2009. Cambridge: Cambridge University Press. Chapter: 6, pp.177-204.
- Boettiger, S., Toyama, K. and Abed, R., ed. (2012). *Natural Obsolescence of Village Phone* Proceedings of the Fifth International Conference on Information and Communication Technologies and Development, Atlanta, Georgia USA, March 12-15 2012, ACM.
- Bruton, G.D., Khavul, S. and Chavez, H. (2011). *Micro lending in Emerging Economies: Building a New Line of Inquiry from the Ground Up*. Journal of International Business Studies, 42 (5), pp.718-739.
- Chambers, R. and Conway, G. (1992). *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*. UK: Institute of Development Studies. Available through: google at: <<http://opendocs.ids.ac.uk/opendocs/handle/123456789/775>>
- Chew, H. E., Levy, M.R. and Ilavarasan, P.V. (2011). *The Limited Impact of ICTs on Microenterprise Growth: A Study of Businesses Owned by Women in Urban India*. Information Technologies & International Development, 7 (4), pp.1-16.
- Chew, H.E., Ilavarasan, P.V. and Levy, M.R. (2010). *The Economic Impact of Information and Communication Technologies (ICTs) on Microenterprises in the Context of Development*. The Electronic Journal of Information Systems in Developing Countries, 44 (4), pp.1-19.
- De Soto, H. (1989). *The Other Path: The Invisible Revolution in the Third Worlds*. New York: Harper and Row.
- DFID (2000). *DFID's Sustainable Livelihoods Approach and its Framework*. Available at: http://www.glopp.ch/B7/en/multimedia/B7_1_pdf2.pdf
- Donner, J. (2004). *Micro-entrepreneurs and Mobiles: An Exploration of the Uses of Mobile Phones by Small Business Owners in Rwanda*. Information Technologies and International Development, 2 (1), pp.1-21.

- Donner, J. (2006). *The Use of Mobile Phones by Micro-entrepreneurs in Kigali, Rwanda: Changes to Social and Business Networks*. Information Technologies and International Development, 3 (2), pp.3-19.
- Donner, J. (2007). *Customer Acquisition among Small and Informal Businesses in Urban India: Comparing Face-to-face and Mediated Channels*. EJISDC: The Electronic Journal on Information Systems in Developing Countries, 32 (3), pp.1-16.
- Donner, J. (2009). *Mobile-based Livelihood Services in Africa: Pilots and Early Deployments*. Communication Technologies in Latin America and Africa: A Multidisciplinary Perspective, pp.37-58.
- Donner, J. and Escobari, M.X. (2010). *A Review of Evidence on Mobile Use by Micro and Small Enterprises in Developing Countries*. Journal of International Development, 22 (5), pp.641-658
- DOTForce, (2001). *Digital Opportunities for All, Digital Opportunity Task Force*. Available at: <http://www.g7.utoronto.ca/summit/2001genoa/dotforce1.html>
- Duncombe, R. (2007). *Using the Livelihoods Framework to Analyze ICT Applications for Poverty Reduction through Microenterprise*. Information Technologies & International Development, 3 (3), pp.81-100.
- Duncombe, R. and Heeks, R. (2005). *Information & Communication Technologies (ICTs), Poverty Reduction and Micro, Small & Medium-scale Enterprises (MSMEs): A Framework for Understanding ICT Applications for MSMEs in Developing Countries*. Vienna: United Nations Industrial Development Organisation.
- Duncombe, R., & Heeks, R. (2002). *Enterprise across the digital divide: information systems and rural microenterprise in Botswana*. Journal of International Development, 14(1): 61–74.
- Ellis, F. (2000). *Rural Livelihoods and Diversity in Developing Countries*. Oxford: Oxford University Press.
- Essegbey, G.O. and Frempong, G.K. (2011). *Creating Space for Innovation - The Case of Mobile Telephony in MSEs in Ghana*. Technovation, 31 (12), pp.679-688.
- Farrell, D. (2004). *The Hidden Dangers of the Informal Economy*. McKinsey Quarterly, 3, pp.26-37.
- Filardi, F., Filippe, B. and Adalberto, F. (2018). *Business strategies for the bottom of the pyramid: multiple case studies of large companies in the pacified communities of Rio de Janeiro*. RAUSP Management Journal, 53 (10), pp-63-73.
- Frempong, G. (2009). *Mobile Telephone Opportunities: The Case of Micro-and Small Enterprises in Ghana*. Info, 11 (2), pp.79-94.
- Gelb, A., Mengistae, T., Ramachandran, V. and Shah, M.K. (2009). *To Formalize or Not to Formalize? Comparisons of Microenterprise Data from Southern and East Africa*. Centre for Global Development: Working Paper 175.
- Good, T. and Qureshi, S. (2009). *Investigating the Effects of Micro-enterprise Access and Use of ICTs through a Capability Lens: Implications for Global Development* Proceedings of the second Annual SIG Global Development Workshop, December. Phoenix, USA, December 14 2009, USA.
- Habib, M. (2012). *Can ICT Be a Catalyst in Microfinance Program: A Conceptual Model*. International Journal of Sustainable Development, 5 (5), pp.87-98.
- Heeks, R. (2009). *Emerging Markets IT and the World's "Bottom Billion"*: Communications of the ACM, 52 (4) pp.22-24.
- Heeks, R. (2010). *Do Information and Communication Technologies (ICTs) Contribute to Development?* Journal of International Development, 22 (5) pp.625-640.

- Heeks, R., Foster, C. and Nugroho, Y. (2014) *New models of inclusive innovation for development, Innovation and Development*, 4:2, 175-185, DOI: 10.1080/2157930X.2014.928982
- Ilahiane, H.a.S.J. (2012). *The Problematics of the "Bottom of the Pyramid" Approach to International Development: The Case of Micro-Entrepreneurs' Use of Mobile Phones in Morocco*. *Information Technologies & International Development*, 8 (1), pp.13-26.
- Ilavarasan, P.V. and Levy, M.R. (2012). *ICT Access and Use by Micro-entrepreneurs in Mumbai, India: A Value Chain Model Analysis*. Proceedings of the Fifth International Conference on Information and Communication Technologies and Development, Atlanta, Georgia USA, March 12-15, 2012, ACM.
- ITU (2018). *ITU-D: Driving ICT-led Development Worldwide*. Available at: <https://www.itu.int/web/pp-18/en/backgrounder/itu-d-driving-ict-led-development-worldwide>
- Jagun, A., Heeks, R. and Whalley, J. (2008). *The Impact of Mobile Telephony on Developing Country Micro-enterprise: A Nigerian Case Study*. *Information Technologies & International Development*, 4 (4), pp. 47-65.
- Jensen, R. (2007). *The Digital Divide: Information (technology), Market Performance, and Welfare in the South Indian Fisheries Sector*. *The Quarterly Journal of Economics*, 122 (3), pp.879-924.
- Kauffman, R.J. and Riggins, F. J. (2012). *Information and Communication Technology and the Sustainability of Microfinance*. *Electronic Commerce Research and Applications*, 11 (5), pp.450-468.
- Kenny, C. (2002). *Information and Communication Technologies for Direct Poverty Alleviation: Costs and Benefits*. *Development Policy Review*, 20 (2), pp.141-157.
- Kleine, D. (2009). *The Ideology Behind the Technology—Chilean Micro-entrepreneurs and Public ICT Policies*. *Geoforum*, 40 (2), pp.171-183.
- Kolk, A, Rivera-Santos, M and Ruffin, C. (2014). *Reviewing a Decade of Research on the "Base/Bottom of the Pyramid" (BOP) Concept*. *Business and Society*, 53 (3), pp- 338-377
- Kuriyan, R., Ray, I. and Toyama, K. (2008). *Information and Communication Technologies for Development: The Bottom of the Pyramid Model in Practice*. *The Information Society*, 24 (2), pp.93-104.
- LaPorta, Rafael, and Andrei Shleifer. (2008). "The Unofficial Economy and Economic Development." *Brookings Papers on Economic Activity* 47 (1): 123-135.
- Lateh, M., Hussain, M. and Ab. Halim, M.S. (2017). *Micro Enterprise Development and Income Sustainability for Poverty Reduction: A Literature Investigation*. *International Journal of Business and Technopreneurship*, 7. 23-38.
- Liedholm, C. and Mead, D.C. (1999). *Small Enterprise and Economic Development. The Dynamics of Micro and Small Enterprises*. London and New York: Routledge.
- Makoza, F. and Chigona, W. (2012). *The Livelihood Outcomes of ICT Use in Microenterprises: The Case of South Africa*. *The Electronic Journal of Information Systems in Developing Countries*, 53 (1), pp.1-16.
- Mas, I. (2009). *The Economics of Branchless Banking. Innovations*, Vol. 4, No. 2. Available at SSRN: <https://ssrn.com/abstract=1552750>
- Midgley, J. (2008). Microenterprise, global poverty and social development. *International Social Work*, 51(4), 467.
- Morgan, K. (2017). *Growth, Inequality and Poverty Reduction*. Available at: <https://www.elsevier.com/connect/atlas/growth,-inequality,-and-poverty-reduction>

- Moyi, E.D. (2003). *Networks, Information and Small Enterprises: New Technologies and the Ambiguity of Empowerment*. *Information Technology for Development*, 10 (4), pp.221-232.
- Prahalad, C.K. (2010). *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits*. 3rd ed. New Jersey: Prentice Hall.
- Prahalad, C.K. and Hammond, A. (2002) *Serving the World's Poor, Profitably*. *Harvard Business Review*, 80, 48-57.
- Prahalad, C.K., and S. Hart (2002) *The Fortune at the Bottom of the Pyramid*. *Strategy+Business* 26.1 (Spring 2002): 55-67.
- Roldan, G. and Wong, A. (2008). *Building Micro-enterprises Through Information and Communication Technologies (ICT) in Bangladesh*. Available at: http://www.academia.edu/2604624/Building_microenterprises_through_information_and_communication_Technologies_ICT_in_Bangladesh
- Rogerson, C.M. (2008). *Tracking SMME Development in South Africa: Issues of Finance, Training and the Regulatory Environment*. 19 (1), pp.61-81.
- Shaw, J. (2004). 'Microenterprise occupation and poverty reduction in microfinance programs: evidence from Sri Lanka', *World Development*, vol. 32, no. 1, pp. 1247-1264.
- Sen, A. (2010). *The Mobile and the World*. *Information Technologies & International Development*, 6 (Special Edition), pp.1-3.
- Sen, A. (1999). *Development as Freedom*. Oxford: Oxford University Press.
- Sey, A. and Fellows, M. (2009). *Literature Review on the Impact of Public Access to Information and Communication Technologies*. CIS Working Paper No. 6. Seattle, USA: Center for Information and Society, University of Washington.
- Smelser, N.J. and Swedberg, R. (2010). *The Handbook of Economic Sociology*. 2nd ed. Princeton, New Jersey: Princeton University Press.
- Spence, M., 2010. Some Thoughts on ICT and Growth. *Information Technologies & International Development*, (Special Edition), pp.5-9.
- Wolcott, P., Kamal, M. and Qureshi, S. (2008). *Meeting the Challenges of ICT Adoption by Micro-enterprises*. *Journal of Enterprise Information Management*, 21 (6), pp.616-632.

