

## **RESEARCHING ICT MICRO-ENTERPRISE IN DEVELOPING COUNTRIES: THEMES, WIDER CONCEPTS AND FUTURE DIRECTIONS**

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### **ABSTRACT**

The purpose of this paper is to examine the current state of knowledge on ICT micro-enterprise in developing countries and provide guidance for future research. It does this by reviewing two strands of literature. In the first, it reviews the literature related to ICT micro-enterprises, focussing particularly on two sub-sectors that might be considered successful, mobile entrepreneurship and the Nigerian video-film industry. It draws out three key themes that are addressed in the literature – the significance of local networks and supply chains; strategies of niches and appropriation; and the importance of context.

This analysis also reveals a significant weakness in the literature. Studies have generally made a close focus on the local practices and technology actions of such micro-enterprises, but there has been little analysis of such micro-enterprise within wider conceptual frameworks, which means that there are significant gaps relating to understanding of the developmental role and potential of such ICT micro-enterprise.

Thus, the broader development literature is reviewed related to the three key themes that were identified. This wider literature highlights three conceptual literatures – enterprise clustering and upgrading, base-of-the-pyramid markets, and urban development – that are able to offer some useful lenses for researching ICT micro-enterprise, as well as highlighting potential future research directions.

**Keywords:** ICT micro-enterprise, entrepreneurship, technology appropriation, developing countries

### **1. POSITIONING ICT MICRO-ENTERPRISE**

Micro-enterprises<sup>1</sup> provide significant employment in developing countries and have a strong influence in providing for those close to poverty (Mead & Liedholm 1998). Such micro-enterprises have traditionally been connected with small goods trading and industrial production (Brown 2006, Nadvi & Schmitz 1999), but increasingly micro-enterprises are emerging in developing countries which centre on information and communication technologies (ICTs). In this paper, we examine the emergence of such enterprises, which are likely to become increasingly prevalent in developing countries and, given appropriate policy conditions, might have a wider transformational effect on the economy. We follow the definition of an 'ICT micro-enterprise' being one where there is *extensive* application of ICT; that is, the micro-enterprise uses ICTs as the key input for new products and services as opposed to enhancing pre-existing ones<sup>2</sup> (Heeks 2008c).

<sup>1</sup> There are multiple approaches in the literature to defining micro-enterprises: size, number of employees, sector, and market type. In general, agreement is that they are small in nature (typically less than ten 'employees' including family labour) and their products are predominantly orientated towards the market rather than intra-household redistribution (Levy 2010, Mead & Liedholm 1998).

<sup>2</sup> The more methodical literature on ICT and mobile use within existing SMEs in the South (e.g. Donner 2004, Donner 2005, Duncombe & Heeks 1999, Horst & Miller 2006, Jagun et al. 2008, Molony 2007) has argued that ICTs, whilst aiding some transactions and collapsing spatial distance, have often been adopted as a useful, but peripheral tool and not transformed existing work patterns or power structures for SMEs.

Historically, micro-enterprises have been seen as a crucial poverty 'safety net' in developing countries, providing small incomes and jobs where the formal sector has failed. More dynamic micro-enterprise can emerge, but growth is often limited by a number of factors; access to goods, markets and capital, close connection into unstable livelihoods as well as policy and spatial factors related to localities (Brown 2006, Mead & Liedholm 1998). ICT micro-enterprises offer potential through their greater ability for innovations connected to the inherent flexibility of ICT products. Additionally, digital production and digital products might sidestep traditional SME constraints related to raw materials, transportation or markets (Castells 2000). In sum, the potential of ICT micro-enterprise is that similarly to conventional micro-enterprises, they offer 'safety nets' to quickly provide income and jobs, yet the flexible and dynamic nature of ICTs offers intriguing potential for adaptive survival and dynamic growth from their often lowly origins.

The task of this paper, then, is to examine the current state of knowledge and to offer guidance for research into ICT micro-enterprise in developing countries. We begin in Section 2 by reviewing the literature, particularly focussing on two 'successful' examples of ICT micro-enterprise. Three key themes are addressed in the literature, the significance of local networks and supply chains; strategies of niches and appropriations; and the importance of context. The literature review also highlights a significant gap; there is a lack of work which looks beyond the local practices and technology use of ICT micro-enterprise to build wider conceptual models, and this results in a fragmentary literature often focussing solely on a certain sub-sector. As such, ICT micro-enterprises remain rather peripheral in discussions of ICT within a development context, with little coherent understanding of their characteristics or potential. Given this fragmentary literature, fundamental questions regarding the development and poverty-relieving potential of ICT micro-enterprise have not fully been explored as yet. Thus, in Section 3, drawing on the three themes from the literature review, we look to wider conceptual work from development; in enterprise clustering and upgrading, base-of-the-pyramid markets and urban development. Each of these literatures offers a potential wider understanding in which one can examine the role of ICT micro-enterprise, and highlight a number of future research directions – suggested in the final section – which can begin to answer these fundamental questions.

## 2. KEY THEMES IN THE ICT MICRO-ENTERPRISE LITERATURE

The focus of this work comes from the evidence of a growing number of ICT micro-enterprises in developing countries. Examples of extensive ICT micro-enterprises<sup>3</sup> found worldwide include: local 'ecosystems' of mobile services and sellers (Sey 2008), micro-enterprises related to international telecoms and voice over IP provision (Southwood 2007), local film and video production and distribution (Larkin 2004), small cybercafés and 'gold farming' (Heeks 2008b). There is also evidence of digital music production sectors in Dakar, Kinshasa, Nairobi and Accra and a critical mass of gaming centres in South East Asia and Brazil, predominantly made up of ICT micro-enterprises.

To date, literature in some sub-sectors of ICT micro-enterprise is only descriptive, whilst in others there is a more substantive body of work. Thus, it is prudent to examine the sub-sectors where analysis is more advanced, looking for common themes which might have wider relevance to all ICT micro-enterprises in developing countries. Given our stated interest in the developmental potential of ICT micro-enterprise, a particular focus of this

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However, *extensive* ICT micro-enterprises where ICT is central to operation are markedly different. They embrace technology at the centre of their practice rather than simply modulating it into existing practices over time.

<sup>3</sup> In this paper we take ICT in its broader sense rather than confining it solely to a narrow 'PCs and mobile' viewpoint

review is to examine sub-sectors of ICT micro-enterprise which operate close to those in poverty in developing countries.

In this section, we examine the literature on ICT micro-enterprise to reveal three key themes of discussion; the importance of *local networks and supply chains* which provide the environment in which micro-enterprises connect and operate; the prevalence of local customers and the *niche strategies and appropriation* of ICT micro-enterprises; and the *importance of context* which is often unstable, and how the micro-enterprise is able to react to these changes.

## **2.1 Two Illustrative Cases of ICT Micro-Enterprise**

Whilst we refer to other examples in this section, we particularly explore two particular sub-sectors of ICT micro-enterprise, mobile micro-enterprise and the Nigerian video-film industry. These two sectors were specifically chosen as they can be seen as illustrative case-studies of more successful ICT micro-enterprises, which have a more mature literature. They follow closely the previous outline of ICT micro-enterprise, as providing employment for the more marginal, but with indications of adaptive survival and growth. The two cases also illustrate two contrasting positions as related to technology in ICT micro-enterprise. The sub-sector of video-film has emerged locally and adapted existing technologies for its use, whilst, mobile micro-enterprise is more intimately connected into the wider mobile industry, and technology flows from larger enterprises. These two sectors are descriptively introduced below and analytically expanded in later sections.

### **2.1.1 Mobile Micro-Enterprise**

Mobile micro-entrepreneurs are present in many parts of the world, emerging to serve local demand for mobiles, and to provide associated mobile products and services (Deloitte 2008). Mobile micro-enterprises can take any number of roles in the mobile industry such as selling mobile cards, phones, accessories, mobile repair or unlocking services. Typically these services are provided by individual entrepreneurs or small organisations that for reasons of tax, licence, location or products lie outside legal norms – the so-called *informal sector* (Chen et al. 2002).

Mobile micro-enterprise should not be considered as disconnected from the wider mobile industry. Even with their often informal status, such entrepreneurs are connected into relationships that reach back to formal mobile vendors, operators and applications providers. As such, mobile micro-entrepreneurs can be seen as central to the roll out and adoption of mobile telephony in the developing world, particularly where organisations seek to maximise mobile coverage and take-up amongst the poor (Sey 2008).

### **2.1.2 Nigerian Video-Film**

The Nigerian video-film industry offers an insight into the wider potential of ICT micro-enterprises. Taken together, the industry is a provider of significant income and employment (Ugor 2007, Zajc 2009), particularly in its urban centres of production, and it revolves around a sector of ICT micro-enterprises.

There is little in the way of a definitive description of the emergence of the Nigerian video-film industry. One stream connects growth to socio-political factors: the Nigerian civil war in the '70s, the closure of the formal cinema industry, followed by an increase in consumption as a result of the oil boom (Larkin 2004, Zajc 2009). Another stream connects the rise closely with ICT entrepreneurship. Some early popular films have been put down to enterprising video cassette importers, who started to finance films as a way of selling cassettes (Haynes 2007, Zajc 2009). In addition, the move to digital filmmaking – using cheap cameras, PC editing software and copying technology – means that many facets of the

industry operate in the informal sector (Haynes 2008). Additionally, the industry provides space for a number of other ICT-related innovations such as the production of film posters, film music and related magazines (Larkin 2008).

Crucial in the growth and survival of the Nigerian video-film industry has been the ability of these video-films to reach a large audience of consumers. One cannot underplay the importance of the micro-enterprises connected to distribution, media copying, and informal trading via market sellers and video centres (Larkin 2008). This network originally emerged as a way to efficiently distribute pirated US and Indian films, but gradually over time it has additionally become the principal distribution channel for locally-made video-films, religious cassettes and music (Larkin 2008).

## **2.2 Local Networks and Connections in ICT Micro-Enterprise**

ICT micro-enterprises rarely act alone in developing countries, with successful micro-enterprises tending to have dense interconnections between organisations in a locality. This applies to both the 'horizontal' connections between micro-enterprises, and the 'vertical' connections that allow a flow of goods, services and other resources along the business value chain. Because of the proximity and informality of the connections, they can be understood as both social and business networks. The predominance of urban settings of ICT micro-enterprise suggests that the density and relative efficiency of the connections and flows in these networks are likely to be more prevalent in urban areas.

### **2.2.1 Horizontal and Vertical Connections**

Connections between ICT micro-enterprises particularly as played out within localities are crucially important. Given the small size of ICT micro-enterprises, they often fulfil only a few specific tasks. It is only through their connection into a wider group of micro-entrepreneurs, that they can succeed. In mobile micro-enterprise this interconnection often occurs within a street, market or bazaar that can geographically provide a wider range of services to customers (Ilahiane & Sherry 2008, Lugo & Sampson 2008, Sundaram 2009).

Such groupings also provide additional advantages, by potentially providing locations for newcomers to connect and learn the ropes (Rangaswamy 2009a), in the sharing of suppliers and storage (Ilahiane & Sherry 2008), and in shared approaches to local problems and issues (Sundaram 2009).

Beyond such horizontal connections between ICT micro-enterprises, micro-enterprises vertically connect into value chains – upstream networks into wholesalers and other suppliers, and downstream networks into customers. In mobile micro-enterprises, these value chains connect into more formal enterprises, but connections are often informal and potentially reconfigurable from the point of view of the micro-entrepreneur (Lugo & Sampson 2008). This contrasts to the rigid formalised agreements that are often associated with formal enterprise, and this provides part of the dynamism of such informal mobile enterprises. Despite this flexibility, supplier connections are still crucial in other ways, particularly when seen as a source of knowledge and social capital. For example, Rangaswamy's (2009a) work on mobile micro-entrepreneurs in Mumbai stresses the importance of the mobile agent to informal airtime sellers. The mobile agent acts more as a mentor to entrepreneurs than a simple seller of goods, taking their own time to help train the sellers and providing them with cheap call time as an incentive to stay loyal.

Horizontal and vertical connections are less easily separable in the Nigerian video-film industry. In this case supply of video-film is not connected by hierarchical chains into formal enterprises in the same way as mobile. Studies suggest instead that networks in Nigerian video-film display aspects of both horizontal and vertical connection. Chains of production are generally centred around the uneasy relationship between the 'marketeters', who mainly finance and distribute films and the subservient 'producers' (Larkin 2008, Ugor

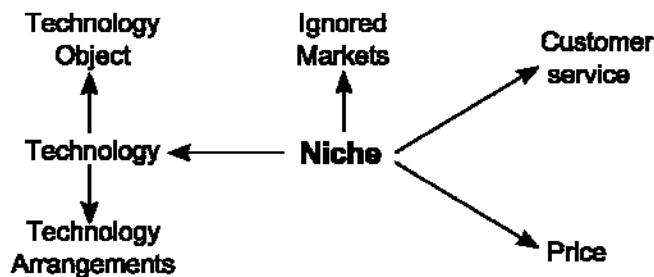
2007). Over time alternative production chains have emerged. One centres around a more empowered producer, emerging from the middle-class, who finds funding through friends and other social network connections and generally connects into the growing middle classes and the diaspora (Ugor 2007). Religious films follow a completely different path, financed by religiously minded institutions and individuals, and then distributed through congregations and religious networks (Larkin 2004, Ugor 2007).

In general, network relationships in ICT micro-enterprise are marked by not just tangible flows (of goods, of money) but also intangible flows (especially of knowledge and connections). As illustrated in the Nigerian case, connections are also marked not just by fully-commercial relations but also by social relations, and embed both historic issues and varied power balances. The specificity of environment also suggests that one may need to avoid generalities and make a careful study of localised practice in any given situation with respect to the networked relations of ICT micro-entrepreneurs.

## 2.3 Niche Strategies of ICT Micro-Enterprise

### 2.3.1 Niche

Examining the diverse services and goods that are offered by ICT micro-enterprises, it is noticeable that a number of these enterprises provide some kind of inventive 'niche' which differentiates them from the wider market, for a specific set of customers. There are a number of different articulations of niche in the literature as shown in Figure 1 and outlined below.



**Figure 1:** Different approaches to niche seen in the literature on ICT micro-enterprise

In mobile micro-enterprise, informal settings are often marked by the ability of vendor and customer to discuss or interact with mobile technology in a substantial way, before or after the sale (Chipchase & Tulusan 2007, Ilahiane & Sherry 2008). This is most aptly described by the Moroccan mobile entrepreneurs who “will sit down with their customers, show them how to navigate the interface, and discuss the relative merits of various technologies” (Ilahiane & Sherry 2008 p.351). Similarly, with mobile services, the informal entrepreneur will often assist customers in the transactions, and hence provide customer service and value added through 'mediated use' (Chipchase 2009). This value-adding *customer service niche* – based on the specific skills, knowledge, and connections of the micro-entrepreneur and their ability to invest a key commodity: time to build a social as well as commercial relation – is not a side issue, but an essential part of business strategy (Chipchase 2009)

Technological changes are another strategy which allows ICT entrepreneurs to build niches to fit into everyday lives. This can come through niches in *technology arrangements*, to allow customers to carry out common tasks more easily. Studies of mobile micro-enterprise have documented a number of cases of such niche arrangements (Barendregt 2008, Chipchase 2009, Qiu 2008, Tall 2004). *Senté* is one example, an informal model of money transfer over long distances using call cards, which has emerged from informal micro-

entrepreneurs. It requires informal kiosk operators to cooperate over longer distances and allows customers to transfer remittances conveniently with less expense (Chipchase & Tulusan 2007).

In Nigerian video-film, the ICT-mediated processes and business models necessary to create, distribute and sell video-films are significantly adapted to task and locality. For example, given rampant piracy and the rapidity of film releases into the distribution networks, financiers in the industry only have a small window in which to recoup investment. Hence the low quality form of production is shaped by the need for low budgets and a full production cycle of 10 days to 1 month (Zajc 2009). Whilst there are no in-depth analysis, we infer that these limitations are likely to result in niche technology arrangements, in ICT use and ICT mediated practices that have a very particular and localised form, specific to the Nigerian context.

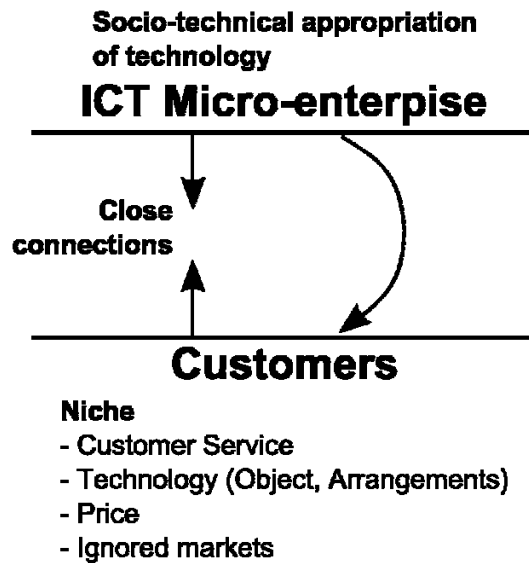
Beyond niche technology arrangements or services connected to ICTs, there are also *niches of the technology object* itself (hardware or software). In mobile micro-enterprise this is particularly true in more emerging economies. For example, micro-enterprise repairers offer services which modify the innards of mobile phones to allow customers to use dual sims which then permits cheaper calling (Barendregt 2008, Chipchase 2009).

ICT micro-enterprises can often provide a *price niche* over more formal suppliers. Studies suggest this sits outside economies of scale, rather products are split down, into smaller portions, or services reconfigured, to fit in with the cash flows of less affluent customers. In mobile enterprise this can be seen in the way that phone top-ups are broken down into cheaper portions by entrepreneurs (Rangaswamy 2009b) or through providing cheaper alternatives to formal products, such as by selling unbranded Chinese phones (Rangaswamy 2009b). In Nigerian video-film, Zajc (2009) outlines the particular importance of the video centre, generally a small ICT micro-enterprise. Such video-centres innovate by adding viewing spaces to allow those who cannot afford to buy, to view the films on site.

Finally ICT micro-enterprises may also venture into niche provision for *ignored markets* where the formal sector does not operate. Thus, rather than the informal and formal being in competition and antagonistic, it may be that there is some level of complementarity. The Nigerian video-film industry provides a successful case study where cultural goods that the formal sector has rejected as not profitable, have been produced by entrepreneurs able to step in and profitably provide for this untapped market.

### **2.3.2 Proximity to, and 'Ethnographic' Understanding of Niche Market Customers**

As summarised in Figure 2, there is a close connection between 'niche' strategies and ICTs through the concept of *socio-technical appropriation*: localised adaptations of technology and techniques by entrepreneurs.



**Figure 2:** Connection between appropriations, strategies of niche and ‘proximity’

The way that ICT micro-enterprises find and serve these niches can be attributed to their knowledge of the ICTs and their very close connections to their customers. It is only through an intricate understanding of the sector, sub-sector and customers that entrepreneurs are able to provide this 'niche' differentiation. For many informal ICT micro-entrepreneurs, being close to their customers is a matter of daily life, and this is a crucial source of their 'ethnographic' understanding.

The ability to reconfigure and appropriate is at the core of ICT enterprises' potential to survive. As Rangaswamy (2007) notes in her study of small slum internet cafes, in such informal spaces, the shifting needs and technologies mean that such enterprises often only make small profits, and it is only through niche-serving adaptations that such cafes survive.

The resources and capacities ICT micro-enterprises have for appropriation are often very limited. Yet that very resource-poverty can also be a stimulus to adaptation; forcing these enterprises to find a different way of doing things in order to overcome the resource-poverty of their context.

## 2.4 Unstable Contexts

### 2.4.1 From Static Models to Dynamic Strategies

In general, all micro-enterprises (whether connected to ICTs or not) are highly volatile, often affected by unstable contexts; the livelihoods of entrepreneurs, the local effects of institutions and increases in competition (Mead & Liedholm 1998). In addition to these factors, ICT micro-enterprise also has to deal with changing trends and policy relating to technology.

This contextual instability is an inevitable part of daily life for ICT micro-enterprises. In the case of 'village phone' entrepreneurs in Bangladesh, volatility arose from increasing personal use of phones (Aminuzzaman et al. 2003); in the histories of Indian mobile sellers it came from the decline of older media such as cassettes (Rangaswamy 2008); and in internet micro-enterprises in China, it came from a change in the strategy by owners of internet and gaming centres, presumably connected to increased competition (Heeks 2008b). Hence whilst success in ICT micro-enterprises is likely to follow characteristics related to niche and appropriation, as outlined in the preceding sections, such strategies are likely to be transient in their form.

Thus, whilst it is possible for an ICT micro-enterprise to find a successful strategy at one point of time, it is important that models and technologies are dynamic and evolve as

wider changes occur. Successful ICT micro-enterprises must therefore be "scanners" that are highly context sensitive. This has implications for any analysis of ICT micro-enterprise emergence and growth. Whilst 'the enterprise' or 'the sectors' are crucial lenses to understand practice, one cannot infer conclusions directly from their rise and fall, particularly if one studies them only at a single point in time.

#### ***2.4.2 Path, Learning and Livelihood Strategies***

It is hence useful to highlight some aspects of individual strategies from the literature on ICT micro-enterprise which provides some pointers into the relationship between unstable contexts and the dynamics of ICT micro-entrepreneurs.

The literature suggests that entrepreneurs tend to build knowledge and capacity by shifting between enterprises. Starting an ICT micro-enterprise often connects into earlier ICT industries, as well as parallel sectors with similar technical skill-sets. In India, mobile sellers often come from the electronics repair and media distribution industries popular in the '90s (Sundaram 2009); in Morocco, an entrepreneur is documented as moving from car repair to mobile (Ilahiane & Sherry 2008); ICT micro-entrepreneurs are also documented as previously working in the formal IT and media economies in several cases (Lugo & Sampson 2008, Wu & Zhang 2009, Zajc 2009). Given the often low barriers into ICT micro-enterprises, such as mobile card selling or video-film vending jobs, there is also room for new, less skilled entrepreneurs to join ICT micro-enterprises (Chipchase 2009 p.10).

In terms of learning within micro-enterprises, there is scope for individuals to learn and move into higher value positions. Upgrading of skills occurs in diverse ways, but is often related to utilising the social aspects of local networks outlined previously, through unpaid apprenticeships, friends or small uncertified training entrepreneurs (Chipchase 2009, Rangaswamy 2008, Rangaswamy & Kumar 2008, Rangaswamy 2009b).

Another element of individual strategies within unstable contexts is the extent to which ICT micro-enterprises can mix enterprise work in other sectors, some of them ICT based (e.g. between PC refurbishment and repair, skills training, media distribution and digital photography services (Lugo & Sampson 2008, Rangaswamy 2008, Rangaswamy 2009b, Sundaram 2009)), some non ICT-based (Rangaswamy 2008).

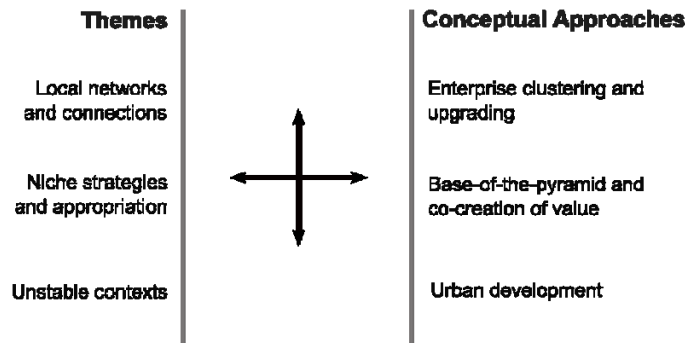
Thus there is interplay, related to the ability to expand one strand of their path while contracting another depending on conditions. The literature is not clear enough for us to pinpoint the level of specialisation, but we can say that there are often blurs between other sub-sectors, and that entrepreneurs can quickly shift between sub-sectors as threats or opportunities emerge.

### **3. UNDERSTANDING ICT MICRO-ENTERPRISES IN DEVELOPING COUNTRIES**

So far, we have used examples of ICT micro-enterprise to outline three key themes that emerge from the literature. As suggested in the review, much of the literature focuses on a particular sub-sector, often examining ground-level practices and technology use of ICT micro-enterprise in some detail. This work is useful and has allowed us to isolate some common themes in the previous section, yet it also has its weaknesses. The strong focus on local practices has resulted in there being gaps in understanding of how ICT micro-enterprises fit into wider socio-economic structures and models of development. One can legitimately argue that even with a growing body of research, fundamental questions regarding the drivers to growth of ICT micro-enterprise, and the forms and structures that make specific sub-sectors of ICT micro-enterprise successful have barely been examined. In sum, for all the power of taking a strong locally-contextualised view, we argue that ICT micro-enterprise research is in danger of missing the 'bigger picture', and that there is a risk that the literature becomes a set of fragmentary analyses of isolated sub-sectors.



In this section, we attempt to fill this identified gap, by proposing some future directions for research on ICT micro-enterprise, identifying a number of useful broader conceptual models relating to the themes that were identified in the literature review. We draw this work from three areas of discussion within the wider development literature which can provide a more coherent connection between practices of ICT micro-enterprise and the 'bigger picture'. Figure 3 below illustrates the three themes identified previously, and the three conceptual directions that will be outlined.



**Figure 3:** Three themes of ICT micro-enterprise and wider conceptual approaches<sup>4</sup>

In terms of the local networks and connections of ICT micro-enterprise, the literature on enterprise clustering and upgrading in supply chains can provide models for how networks of ICT micro-enterprises can actively work together to improve local productivity and value in their production. In terms of the discussion of niche and socio-technical appropriations, we examine the literature relating to strategies of serving base-of-the-pyramid customers, which can provide a lens to examine the niche production and wider connections into formal ICT micro-enterprise. In terms of local context, we discuss urban development and some of the wider policy structures that both aid and inhibit ICT micro-enterprises within their predominant urban settings.

### 3.1 Clustering and Upgrading

#### 3.1.1 Models of Clustering

Clustering is crucial to micro-enterprises in many sectors. We draw upon the rich literature on clustering in developing countries in order to understand its relevance to ICT micro-enterprises. Clustering has been defined as “a geographically proximate group of inter-connected companies and associated institutions in a particular field, linked by commonalities and complementarities” (Porter 2000:254). Hence, studies of clustering in developing countries provide a literature to examine the intricacies of local interactions on the ground.

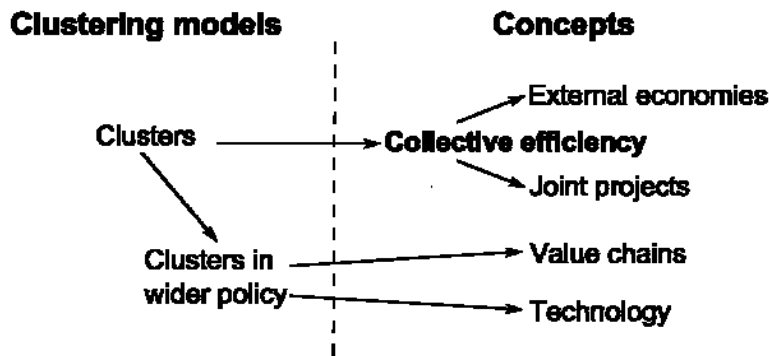
One of the commonly-used frameworks to understand clusters and their significance in developing countries is Schmitz's (1995) model of *collective efficiency*. This defines two dimensions which help clusters to achieve competitiveness. On the one hand, advantage is related to *external economies*; the efficiency gains that are made from firms being closer together. On the other hand, it is related to *joint actions*, where clustered enterprises act

<sup>4</sup> Note that the link between the three themes and the conceptual models is not necessarily one-to-one. For example, whilst cluster models will likely be insightful in understanding the local networks and connections of ICT micro-enterprise, it might also be useful in revealing how niches diffuse in local settings. Thus, the cross-arrow in the centre of the diagram indicates that these themes and models are interconnected. In this paper we draw upon the most typical uses of each of the conceptual frameworks, but further directions could be the source of further study.

together to improve their situation. External economies can be seen as essentially a passive gain which comes from being in a certain advantageous location, whilst joint action requires active work on behalf of the clustered enterprises (Nadvi & Schmitz 1999).

Much of the literature on clustering looks into understanding how such clusters grow, particularly with regard to more mature clusters, and how they are able to move into higher level, better quality work. This relates to the collective efficiency model, and how industrial clusters work together to undertake *joint actions* and move beyond easier gained *external economy* advantages. This can be done for instance through building measures for increasing local trust, upgrading technology, or improving quality of output (UNIDO 2002).

As illustrated in Figure 4, more recently there has been a growing discussion about clusters improving value by linking into transnational value chains (UNIDO 2002). This has been influenced by the success of East Asian economies, where technology-led clusters, connecting into, and upgrading in globalised value chains, has been seen as a key facet in understanding their wider technology-led growth (Mathews & Cho's 2000). Given the globalised nature of production, clustering is increasingly conceptualised as a set of crucial links between inter-connected enterprises, where links into supply chains and policy which allows connection into transnationals, and upgrading are of equal importance (Bell & Pavitt 1993, Bell & Albu 1999).



**Figure 4:** Evolving models of clustering and important concepts for ICT micro-enterprise

### 3.1.2 Growth vs Development

Much of the work on clustering in developing countries positions itself within conceptions of development by economic growth. In their study of clustering and its potential for poverty relief, Nadvi & Barrientos (2004) note that this means that smaller, less dynamic or early growth clusters have been underplayed, even though these clusters might actually be more crucial to poverty. Wider analyses of enterprise in developing countries also suggest that such 'subsistence' clusters and enterprises may have vastly different forms to more dynamic micro-enterprises (Heeks 2008c, Mead & Liedholm 1998). Whilst not to underplay the importance of growth effects of mature clusters on wider poverty reduction, studies related to poverty and clusters need to examine more fully issues such as low paid workers, and how such clusters can balance long-term growth against short-term improvements.

### 3.1.3 Insights for ICT Micro-Enterprise

The discussion on clusters presents a rich conceptual grounding for understanding the networks of ICT micro-enterprise. Using Schmitz's (1995) model of collective efficiency, we can see that work has referred only to the passive *external economy* effects of clustering, concentrating on surface phenomena of interaction without delving too deeply into wider relations or forms. There are suggestions that active *joint actions* at a cluster level may be

beneficial. For example, Sundaram's(2009) analysis of practices amongst pirate electronic traders in Delhi illustrates a number of joint approaches that such groups take to protect their enterprises. However, there is need for further study, particularly given that – where joint actions have been mentioned so far – it has been as reactive rather than proactive measures.

The *collective efficiency* model also provides a framework which argues that more successful dynamic clusters move beyond neoliberal models of autonomous growth, with potential roles for collective actions, including those by the state, support agencies and NGOs. Like early work on industrial clustering (Humphrey 1995), work in ICT micro-enterprise – with its tendency to date to focus on surface phenomena – has not examined the role (if any) of institutions (formal and informal), the state, external agencies and collective action of clusters in their survival and growth.

Similarly, there is little analysis of the wider value chains related to ICT micro-enterprise and if there is potential to upgrade. This may be because contemporary models of value chains and global production networks seem less relevant for ICT micro-enterprises which have customers and suppliers that are more sporadic and localised than typical manufacturing cases (Gereffi 1999, Henderson et al. 2002, Porter 1998). However, we must be careful not to dismiss such concepts: ICT micro-enterprise sectors are still in their youthful stages of growth and in the future, value chains may become more important. It may also be that such clusters of ICT micro-enterprise are part of value chains which do not entirely fit into contemporary models from industrial development, and ICT micro-enterprise can make some useful contributions to conceptual models. In ICT micro-enterprise we can see potential traces of such chains; in 'quieter' supply chains connected to base-of-the-pyramid models and co-creation (see next section), in ICT micro-enterprise connections into the diaspora (e.g in the Nigerian video-film industry (Zajc 2009)), in informal connections directly to consumers through the internet (e.g. in internet service micro-enterprises (Heeks 2008b)), and in South-South supply chains originating from China (e.g in the mobile industry (Rangaswamy 2008)).

Researching ICT micro-enterprise clustering from a poverty perspective, it may also be prudent to examine the internal dynamics of such local networks, to understand local power relations between micro-enterprises, and how this affects those in lowest level roles. A poverty perspective might also encourage work which moves beyond economic measures of success for ICT micro-enterprise, to closely examine the social role played by such networks. Wider models like Sen's (1999) capabilities approach could help here in examining the wider livelihood impact of clustering on those close to poverty.

### **3.2 Base-of-the-Pyramid and Co-Creation**

Studies of the base-of-the-pyramid (BoP), have been used to described how large enterprises can explore opportunities to provide goods and services to poor communities in a way that both generates profits and simultaneously provides benefits for the poor – the so-called 'double bottom-line' (Prahalad 2009). Hence, BoP scholarship provides insight for ICT micro-enterprise by examining strategies to serve marginal customers. Indeed, our previous discussions on ICT micro-enterprise niche and proximity correspond very closely to some of the BoP literature (ibid).

We focus here on studies that examine prudent approaches to embrace BoP customers. This literature critiques approaches of many BoP-focussed enterprises which use traditional hierarchical approaches. In contrast, most successful BoP ventures have adopted highly contextual, social-embedded approaches to achieve success, which gain by offering uniquely tailored products to unique markets (as such we should strictly refer to multiple heterogeneous BoPs as opposed to 'the BoP') (Hart & Christensen 2002, London & Hart 2004).

From the perspective of large enterprises, such a contextual approach to BoP provision does not see microenterprises as competitors, but as essential partners taking part in the process of the 'co-creation' of value, through niche strategies and building alternative business models to reach the BoP. The role of the larger enterprises is to “allow local entrepreneurs, who are more familiar with local culture and customer needs, to innovate proactively” (London & Hart 2004 p.365, Prahalad 2006). Thus, the responsibility of the larger organisation is to provide capacity building, and help smooth problems related to any wider market difficulties.

The relationship between ICT micro-enterprises and larger, more formal enterprises is seen as a potential benefit to both parties. For example, many of the actions of successful mobile operators in developing countries can be seen as a successful case study of reaching the BoP, through their connection into ICT micro-enterprises, allowing space for local innovation and adaptation of business models to reach customers (Chipchase & Tulusan 2007, Chipchase 2009, Rangaswamy 2008).

Thus, the BoP literature provides a conceptual framework to examine how micro- and small enterprises which locally innovate are often being powered (and empowered) by more formal enterprise in BoP partnerships. Such a lens can orientate research toward a more critical analysis of the wider significance of niche building and appropriation rather than it being seen as an end in itself. For all the celebration of local innovation, it may be the supply partners, and not ICT micro-enterprises who are taking much of the profits from BoP sales. Even when there is evidence of vibrant and innovative dynamics in local ICT micro-enterprise, this does not necessarily mean that such BoP ventures will be transformational for poor micro-entrepreneurs in the long term. Indeed, London (2007) notes that for all the poverty relief rhetoric of BoP, in general, organisations still adopt business focussed metrics to analyse their success and failure and as such, there is little evidence beyond anecdotes which points towards poverty alleviation and best practices for poverty alleviation within BoP.

In sum, the BoP literature provides an analytical view of the wider significance of local innovation and its benefit to those who are being innovative at a local level, placing ICT micro-enterprise within an ongoing relationship with larger organisations. This conceptual position orientates towards questions about the fairness of distribution of value between micro-entrepreneurs and larger enterprises, examining socio-technical issues which aid or limit how far entrepreneurs can move in their marginal positions.

### **3.3 The Urban Setting**

We have seen earlier that the wider context in which ICT micro-enterprise sits is of central importance. The examples of successful ICT micro-enterprises we have come across tend to be based in urban centres in developing countries and so in this section, we will discuss the significance of this urban setting to enterprises.

#### **3.3.1 The Urban Setting and Innovation**

There is a growing literature which sees urban spaces as engines of wider development and economic growth (UN Habitat 2001, World Bank 2000). Further, the form of such growth is guided by urban centres, “it is inconceivable that future economic growth in these countries will not heavily depend on the productivity of these cities” (Cohen 1991 p.23).

Advantage of cities for enterprises comes from their positive externalities, agglomeration and higher productivity for those running enterprises (Cohen 1991, Overman & Venables 2005). It is in this more favourable, diverse environment that enterprises have room to try out innovative and new approaches. For innovation, “large diverse metropolitan areas play a role as a 'nursery'” (Overman & Venables 2005, p.8 referring to Duranton & Puga 2001).

For micro-entrepreneurs, we can thus infer that there are factors that push them towards innovating in cities. In this economic view, lower costs due to agglomeration (clustering) mean that more risks can be taken with offerings, close proximity and potential partnerships further reduce the individual costs of innovation. Conversely, in other urban clusters, entrepreneurs may find themselves in a strongly competitive environment in which there is added value from even small innovations (ibid).

In urban settings, micro-entrepreneurs also have a better ability to lower the risk of innovation, by using 'safer' income streams and to effectively cross-subsidise the more innovative work. This is certainly the case in the example of slum internet café owners in Mumbai who see their ICT micro-enterprise as a sideline supported by other enterprises or products. The ICT micro-enterprise is articulated as a future investment which currently only produces a small profit, insufficient to make a living at the present time (Rangaswamy 2008).

Looking at innovation from a social perspective, urban diversity is a key component which encourages innovation. Ethnographic studies have shown that in urban areas, with their constant flux and mixing of people from different settings, 'traditional' identities are constantly being remade and reinterpreted in the light of new connections and influences (Robinson 2006). Thus, the city is naturally a site where innovation emerges through the modulation of historic identities with incoming modernity (ibid.). For ICT micro-enterprise, we can see these theoretical ideas follow very closely accounts of how innovation occurs in India's pirate industries (Sundaram 2009) and Nigeria's video-film culture (Larkin 2008). The juxtaposition of unique historic identities (including colonial ones), and modernism in urban areas, guides innovative locally emergent forms in developing countries and often leads to a locally contextual 'impetus of innovation'.

### ***3.3.2 Urban Governance and Informal Livelihoods and Enterprises***

Whilst the urban setting can be considered a driver of innovation and wider growth, it can also restrict the stability and inhibit the growth of enterprises, and this is likely to be particularly marked for more 'subsistence' micro-enterprises.

In recent times, there would seem to be increasing space for support of micro-enterprises. Decentralisation has been encouraged strongly by the World Bank as a way to allow the poor to have a say in their local policy (World Bank 2000), and resultantly "The gap in serving the public interest is being more and more taken up by local authorities" (UN Habitat 2001 p.xxxii). In terms of action in urban areas, "much of the responsibility for dealing with informal trade falls to urban managers" (Lyons & Snoxell 2005 p.1078). Thus, decentralisation could potentially lead to an advantageous situation for micro-enterprise with close and locally appropriate urban decision making at a local level (UN Habitat 2001).

However in reality, such genuine decentralisation is limited. There are different views as to why this is the case. Fiscal and political control from above still shape what city governments do, with municipalities acting as managerial implementers rather than innovators, with few independent financial resources (Cohen 1991, UN Habitat 2001). Further, there are issues related to the capacity of urban government and their ability to handle the increasing demands of decentralisation, problems with corruption at a municipal level, and coherency in municipal strategy (Cohen 1991, World Bank 2000).

In reality, policy is increasingly driven by wider global discourses even when enacted in a local setting, and the rhetoric is often focussed towards ideas of world cities and global flows of finance and knowledge (Castells 2000, Sassen 2002). Thus, the future of urban areas is often articulated through the desire to attract outside investment leading to regeneration and cities "competing for globally footloose investment" (UN Habitat 2001 p.26), with these global interests taking precedence over the local (ibid).

Such policy can often result in marginalisation of the dwellings, modes of earning or economic settings of the poor and their micro-enterprises (located in 'messy' markets, slums and on the streets) which are the target of 'clean up' and regeneration (Benjamin & Bhuvanewari 2001). Further, new investments are not focussed on reducing inequality, but are often schemes to attract investors with little trickle down (Urban Age 2008).

Thus, problems of urban development may not necessarily be directly linked to economic lack, as much as to the constant instability of economic settings, and lack of availability of support, services and infrastructure, which thus hinders growth (Benjamin 2000, de Soto 1989, World Bank 2000). For micro-enterprises, economic settings are often home based and livelihood issues are one crucial cause of business failure (Mead & Liedholm 1998). As such micro-enterprises, particularly subsistence ones, are prone to problems that come through instabilities and are magnified by a lack of urban services, in health, housing clearance, crime or loss of economic settings (Benjamin 2009, Collins et al. 2009, Mead & Liedholm 1998, Nadvi & Barrientos 2004).

In sum, *entrepreneurial survival and success cannot be disconnected from wider livelihoods of micro-enterprise owners* and as outlined by the analysis on ICT micro-enterprise literature, local livelihood strategies are crucial to understand micro-enterprise. Thus, how the urban poor connect (or not) into NGOs and federations (Harriss 2006, Satterthwaite 2007, UN Habitat 2001), their use of politics (Bayat 2000, Benjamin & Bhuvanewari 2001, Tripp 2002), their ways of managing money (Benjamin 2009, Collins et al. 2009) and support networks of 'social capital' (Benjamin 1991, Nadvi 1999) are all an essential part of understanding the dynamics of urban micro-enterprise.

### 3.3.3 Summary

In sum, debates on the urban setting offer a number of interesting avenues for analysis particularly focussing on policy research. In terms of the connection between urban settings, policy and innovation, we have argued that there are economic factors which encourage ICT micro-entrepreneurs located in urban. There are questions as to what this means for ICT policy and how ICT agencies consequently strategise this.

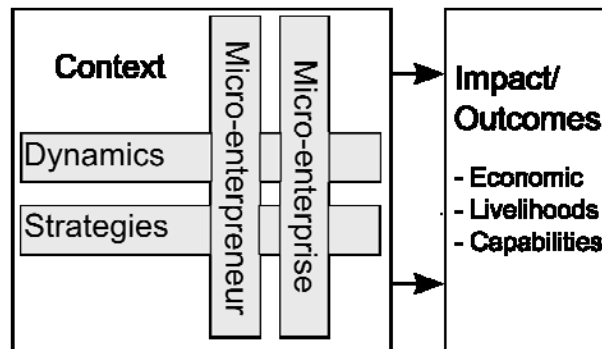
The literature also suggests that there are social factors that are likely to result in innovative directions of ICT micro-enterprise emerging in urban areas. There is evidence that in the past, enlightened states in developing countries have been able to build on their unique 'impetus of innovation' and transform this into wider equitable growth models. (e.g. in Japan and Taiwan (Mathews & Cho 2000, Takahashi 2000)). The case of the Nigerian video-film sector is indicative of this in ICT micro-enterprise. Even in a highly unstable space a uniquely innovative industry has been able to grow and respond to change. For policy makers, there are a number of questions regarding policy about how to turn such a 'unique impetus' into something more widely useful.

In terms of the discussions on urban governance and instability, there is need to analyse ICT micro-enterprise within the wider dynamic strategies of the urban poor related to diversification, risk reduction and employing local tactics to deal with instability. These can provide a more accurate understanding of the ICT micro-enterprises and how local context affects the patterns of growth. For instance, as outlined in the ICT micro-enterprise literature, there are crucial questions about the ways that micro-enterprises, even entire sectors can quickly grow and contract, which may be connected more to livelihood strategies than business successes. Such research is vital to provide advice to policy makers who need to understand how to support such enterprises and how to measure success of the policy which they implement.

## 4. CONCLUSIONS

### 4.1 Moving Beyond the Conventional Enterprise View

What can be seen from this analysis of ICT micro-enterprise is that more conventional understandings of enterprise, business strategies and economic outcomes will present an incomplete understanding of ICT micro-enterprise in developing countries. As summarised in Figure 5, and outlined below, there are a number of crucial aspects of ICT micro-enterprises which diverge from conventional understandings and are worthy of further research.



**Figure 5:** Some key aspects of ICT micro-enterprise from the literature

The discussions of path and livelihoods of entrepreneurs, and how they influence the resultant form of such micro-enterprises, stresses the importance of not focusing solely the ICT micro-enterprise as the scope of research, but also considering the *micro-entrepreneur* and their situation more closely. Equally, whilst particular strategies and tactics (for micro-enterprises and micro-entrepreneurs respectively) provide direction at one point of time, research should also examine the relationships and *dynamic agility* which help enterprises and entrepreneurs to operate in an environment that is urban, informal, and technology-intensive (each one of which imposes its own volatility). Underlying both these considerations is the importance and specificity of each particular context and an understanding of the instabilities that challenge ICT micro-enterprises and micro-entrepreneurs.

In terms of outcomes, such work should not just understood in terms of the income they generate, but also the impact on livelihood assets and the wider livelihood environment, which could also be understood in relation to the development of freedoms and capabilities in a Sen-ian sense.

### 4.2 Future Directions

The literature on ICT micro-enterprise hence points to the importance of further research given the current partial understanding of such processes. Table 1 outlines some potential directions. Column 1 summarises the three overarching themes that were identified from the literature: local networks in Section 2.2, niche strategies and proximity in Section 2.3, and unstable contexts in Section 2.4. We have argued that the literature which examines ICT micro-enterprise more closely is at present lacking in its use of wider conceptual models to understand ICT micro-enterprise and, connected to this lack, we have consequently discussed three wider areas of literature that would be useful in exploring these themes in a more coherent way, as summarised in Column 2 (though noting the potential cross-fertilisation across themes and models, rather than one-to-one correspondence): clusters and policy for upgrading from Section 3.1, BoP strategies from Section 3.2, and the urban development context from Section 3.3. Column 3 takes these models one step further by relating them

directly to ICT micro-enterprise. It identifies some of the under-explored research directions that are pertinent to expand, relative to each of the conceptual positions.

<b>(1) Theme from Literature</b>	<b>(2) Conceptual Model</b>	<b>(3) Potential Research Directions</b>
<b>Local networks</b>	<b>Clusters and industrial policy</b> <i>The interplay and collective work in clusters.</i> <i>How ICT micro-enterprise can upgrade in value chains.</i>	<ul style="list-style-type: none"> <li>• How do clusters enable ICT micro-enterprise to collectively improve their position?</li> <li>• What is the interaction between ICT micro-enterprise roles within clusters (particularly related to poverty)?</li> <li>• What forms of value chain exist in ICT micro-enterprise and what is their significance?</li> <li>• How do ICT micro-enterprises upgrade in value chain?</li> </ul>
<b>Niche and Proximity</b>	<b>Base-of-the-pyramid and co-creation</b> <i>The actors who are part of the co-creation of local innovative models.</i> <i>How relations are structured and the distribution of benefits.</i>	<ul style="list-style-type: none"> <li>• What is the distribution of value when ICT micro-enterprises are connected to more formal enterprises?</li> <li>• What aspects of the relationship with formal enterprises shape the forms and niche production of ICT micro-enterprise?</li> <li>• How do forms of ICT provision from formal enterprise enable or inhibit innovative appropriations?</li> </ul>
<b>Unstable environment</b>	<b>Urban development</b> <i>The potential of innovation in urban areas.</i> <i>The link between enterprises and livelihoods.</i>	<ul style="list-style-type: none"> <li>• Should policy support be given to urban ICT micro-enterprise to make them vehicles of wider growth? How?</li> <li>• How do we identify and nurture innovative forms that emerge for ICT micro-enterprises?</li> <li>• What are the typical lifecycles of ICT micro-enterprises/micro-entrepreneurs?</li> <li>• What is the relation between instability, individual strategies and livelihoods in ICT micro-enterprise?</li> </ul>

**Table 1:** Literature themes, models and research questions for ICT micro-enterprise

For those researching ICT micro-enterprise, we believe that it is important that close analysis of practices and innovative technology use remains a significant component of any research project. However, it is crucial that such analysis is integrated into wider conceptual frameworks. Such work will allow a move away from a narrow focus on local innovation as an end in itself, and towards examining the relation between ICT micro-enterprises and wider socio-economic issues. This is particularly crucial when it comes to analysing the



development and poverty-relieving potential of such enterprises. Such conceptual models also provide structures that can allow study of different sub-sectors of ICT micro-enterprise to become less fragmentary, and provide more substantial work on ICT micro-enterprise that can be understood by policy makers and external agencies.

## 5. REFERENCES

- Aminuzzaman, S., Baldersheim, H. & Jamil, I. (2003) Talking Back! Empowerment and Mobile Phones in Rural Bangladesh: A Study of the Village Phone Scheme of Grameen Bank, *Contemporary South Asia*, 12, 3, 327–348.
- Barendregt, B. (2008) Sex, Cannibals, and the Language of Cool: Indonesian Tales of the Phone and Modernity. *The Information Society*, 24, 3, 160-170.
- Bell, M. & Albu, M. (1999) Knowledge Systems and Technological Dynamism in Industrial Clusters in Developing Countries. *World Development*, 27, 9, 1715–1734.
- Bell, M. & Pavitt, K. (1993) Technological Accumulation and Industrial Growth: Contrasts Between Developed and Developing Countries. *Industrial and Corporate Change*, 2, 1, 157-210.
- Benjamin, S. (2009) *From Income to Urban Contest in Global Settings: Chronic Poverty in Bangalore*. CPRC India Working Paper, 3, University of Manchester, UK. <http://www.chronicpoverty.org/publications/details/from-income-to-urban-contest-in-global-settings-chronic-poverty-in-bangalore>.
- Benjamin, S. (2000) Governance, economic settings and poverty in Bangalore. *Environment and Urbanization*, 12, 1, 35-56.
- Benjamin, S. (1991) Neighbourhood as Factory. PhD Dissertation. Massachusetts Institute of Technology, US.
- Benjamin, S. & Bhuvanewari, R. (2001) *Democracy, Inclusive Governance and Poverty in Bangalore*. Urban Governance, Partnerships and Poverty Research Working Paper, University of Birmingham, UK.
- Brown, A. (2006) *Contested Space: Street Trading, Public Space, and Livelihoods in Developing Cities*. Intermediate Technology Development Group (ITDG), Rugby, UK.
- Castells, M. (2000) *The Rise of The Network Society*. Blackwell Publishing, Oxford, UK.
- Chen, M., Vanek, J., Charmes, J., Guerrero, M., Carré, F., Herranz, J., Budlender, D., Buwembo, P., Shabala, N., Negrete, R., Pedrero, M. and Unni, J. (2002) *Women and Men in the Informal Economy: A Statistical Picture*. International Labour Organisation, Vienna.
- Chipchase, J. (2009) Mobile Phone Practices & The Design of Mobile Money Services for Emerging Markets. <http://www.janchipchase.com/publications>.
- Chipchase, J. & Tulusan, I. (2007) Shared Phone Practices: Exploratory Field Research from Uganda and Beyond. <http://www.janchipchase.com/sharedphoneuse>.
- Cohen, M.A. (1991) *Urban Policy and Economic Development: An Agenda for the 1990s*. World Bank Policy Paper, World Bank Publications, Washington.
- Collins, D., Morduch, J., Demirguc-Kunt, A. & Cull, R. (2009) *Portfolios of the Poor*. Princeton University Press, Princeton, NJ.
- Deloitte (2008) *Economic Impact of Mobile Communications in Serbia, Ukraine, Malaysia, Thailand, Bangladesh and Pakistan*. [http://www.telenor.rs/media/TelenorSrbija/fondacija/economic\\_impact\\_of\\_mobile\\_communications.pdf](http://www.telenor.rs/media/TelenorSrbija/fondacija/economic_impact_of_mobile_communications.pdf)
- Donner, J. (2007) *M-Banking and M-Payments Services in the Developing World: Complements or Substitutes for Trust and Social Capital?* v1.1, <http://www.jonathandonner.com>.
- Donner, J. (2005) User-led Innovations in Mobile Use in sub-Saharan Africa. *Vodafone Receiver*, 14. <http://www.vodafone.com/flash/receiver/14/articles/index02.html>.

- Donner, J. (2004) Microentrepreneurs and Mobiles: An Exploration of the Uses of Mobile Phones by Small Business Owners in Rwanda. *Information Technologies and International Development*, 2, 1, 1-21.
- Duncombe, R. & Heeks, R. (1999) *Information, ICTs and Small Enterprise: Findings from Botswana*. IDPM Working Paper Series, 7, IDPM, University of Manchester, UK. [http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di\\_wp07.htm](http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp07.htm).
- Duranton, G. & Puga, D. (2001) Nursery Cities: Urban Diversity, Process Innovation, and the Life Cycle of Products. *The American Economic Review*, 91, 5, 1454–1477.
- Gereffi, G. (1999) *A Commodity Chains Framework for Analysing Global Industries*. Working Paper, Duke University, Durham, NC.
- Hagedoorn, J. (1996) Innovation and Entrepreneurship: Schumpeter Revisited. *Industrial and Corporate Change*, 5, 3, 883-896.
- Harriss, J. (2006) Middle-Class Activism and the Politics of the Informal Working Class. *Critical Asian Studies*, 38, 4, 445–465.
- Hart, S. & Christensen, C.M. (2002) The Great Leap: Driving Innovation from the Base of the Pyramid. *MIT Sloan Management Review*, 44, 1, 51-56.
- Haynes, J.M. (2008) Nollywood in Lagos, Lagos in Nollywood Films. *Africa Today*, 54, 2, 131-150.
- Haynes, J.M. (2007) Video Boom: Nigeria and Ghana. *Postcolonial Text*, 3, 2.
- Heeks, R. (2008b) *Current Analysis and Future Research Agenda on "Gold Farming": Real-World Production in Developing Countries for the Virtual Economies of Online Games*. Development Informatics Working Paper, 32, IDPM, University of Manchester, UK. [http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di\\_wp32.htm](http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp32.htm).
- Heeks, R. (2008c) *Researching ICT-Based Enterprise in Developing Countries: Analytical Tools and Models*. Development Informatics Working Paper, 30, IDPM, University of Manchester, UK. [http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di\\_wp30.htm](http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp30.htm).
- Heeks, R. & Arun, S. (2010) (Forthcoming) Social outsourcing as a development tool: The impact of outsourcing IT services to women's social enterprises in Kerala. *Journal of International Development*. <http://dx.doi.org/10.1002/jid.1580>.
- Henderson, J., Dicken, P., Hess, M., Coe, N. & Yeung, H.W. (2002) Global Production Networks and the Analysis of Economic Development. *Review of International Political Economy*, 9, 3, 436-464.
- Humphrey, J. (1995) Industrial Reorganization in Developing Countries: From Models to Trajectories. *World Development*, 23, 1, 149-162.
- Ilahiane, H. & Sherry, J. (2008) Joutia: Street Vendor Entrepreneurship and the Informal Economy of Information and Communication Technologies in Morocco. *Journal of North African Studies*, 13, 2, 243-255.
- Jagun, A., Heeks, R. & Whalley, J. (2008) *Mobile Telephony and Developing Country Micro-Enterprise: A Nigerian Case Study*. Development Informatics Working Paper, 29, IDPM, University of Manchester, UK. [http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di\\_wp30.htm](http://www.sed.manchester.ac.uk/idpm/research/publications/wp/di/di_wp30.htm).
- Larkin, B. (2008) *Signal and Noise: Media, Infrastructure, and Urban Culture in Nigeria*. Duke Univ Press, Durham, NC.
- Larkin, B. (2004) Degraded Images, Distorted Sounds: Nigerian Video and the Infrastructure of Piracy. *Public Culture*, 16, 2, 289-314.
- Levy, M. (2010) (Forthcoming) *The Economic Impact of Information and Communication Technologies (ICTs) on Microenterprises in the Context of Development*. Paper presented at: International Communication Association Conference, Singapore,

- London, T. (2007) *A Base-of-the-Pyramid Perspective on Poverty Alleviation*. Working Paper, The William Davidson Institute, University of Michigan, Ann Arbor, MI.
- London, T. & Hart, S.L. (2004) Reinventing Strategies for Emerging Markets: Beyond the Transnational Model. *Journal of International Business Studies*, 35, 5, 350-370.
- Lugo, J. & Sampson, T. (2008) E-Informality in Venezuela: The 'Other Path' of Technology. *Bulletin of Latin American Research*, 27, 1, 102-118.
- Lyons, M. & Snoxell, S. (2005) Creating Urban Social Capital: Some Evidence from Informal Traders in Nairobi. *Urban Stud*, 42, 7, 1077-1097.
- Mathews, J.A. & Cho, T. (2000) *Tiger Technology: The Creation of a Semiconductor Industry in East Asia*. Cambridge Univ Press, Cambridge, UK.
- Mead, D.C. & Liedholm, C. (1998) The Dynamics of Micro and Small Enterprises in Developing Countries. *World Development*, 26, 1, 61-74.
- Molony, T. (2007) 'I Don't Trust the Phone; It Always Lies': Trust and Information and Communication Technologies in Tanzanian Micro-and Small Enterprises. *Information Technologies and International Development*, 3, 4, 67-83.
- Nadvi, K. (1999) Shifting Ties: Social Networks in the Surgical Instrument Cluster of Sialkot, Pakistan. *Development and Change*, 30, 1, 141-175.
- Nadvi, K. & Barrientos, S. (2004) *Industrial Clusters and Poverty Reduction: Towards a Methodology for Poverty and Social Impact Assessment of Cluster Development Initiatives*. UNIDO, Vienna.
- Nadvi, K. & Schmitz, H. (1999) Introduction to: Clustering and Industrialisation: Special Issue. *World Development*, 27, 9, 1503-1514.
- Overman, H.G. & Venables, A.J. (2005) *Cities in the Developing World*. CEP Discussion Paper, 695, Dept. of Geography & Environment, LSE, London.
- Porter, M.E. (1998) *Competitive Advantage: Creating and Sustaining Superior Performance: With a New Introduction*. Free Press, New York, NY.
- Prahalad, C.K. (2009) *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits*. Wharton School Publishing, Philadelphia, PA.
- Prahalad, C.K. (2006) The Innovation Sandbox. *Strategy and Business*, 44, 62-71.
- Qiu, J.L. (2008) Working-Class ICTs, Migrants, and Empowerment in South China. *Asian Journal of Communication*, 18, 4, 333-347.
- Rangaswamy, N. (2009a) *ICT for Mesh-Economy: Case-Study of an Urban Slum*. Paper presented at: IFIP 2009, 26th May, Dubai, <https://research.microsoft.com/en-us/people/nimmir/ifip2009.doc>.
- Rangaswamy, N. (2009b) *Keywords in Communication: Mesh-Economy and Business Channels in an Indian Urban Slum*. Paper presented at: ICA 2009, Pre-Conference on India and Communication Studies, 21st May, Chicago, <http://research.microsoft.com/en-us/people/nimmir/pre-confica2009.doc>.
- Rangaswamy, N. (2008) Telecenters and Internet Cafes: The Case of ICTs in Small Businesses. *Asian Journal of Communication*, 18, 4, 365-378.
- Rangaswamy, N. & Bombay, L.S. (2007) *ICT for Development and Commerce: A Case Study of Internet Cafés in India*. Paper presented at: 9th International Conference on Social Implications of Computers in Developing Countries., 27th May, Sao Paulo, Brazil, <http://www.ifipwg94.org.br/fullpapers/R0071-1.pdf>.
- Rangaswamy, N. & Kumar, D. (2008) *The Rise of ICT for Commerce in Small Product Offerings: Case studies from India*. Paper presented at: 19th Australasian Conference on Information Systems, 3rd Dec, Christchurch, Australia, <http://www.bsec.canterbury.ac.nz/acis2008/Papers/acis-0150-2008.pdf>.
- Robinson, J. (2006) *Ordinary Cities: Between Modernity and Development*. Routledge, London.

- Sassen, S. (2002) *Cities in a World Economy*. Pine Forge Press, Thousand Oaks, CA.
- Satterthwaite, D. (2007) *The Transition to a Predominantly Urban World and Its Underpinnings*. Human Settlements Working Paper, Urban Change, 4, IIED, London.
- Schmitz, H. (2007) Transitions and Trajectories in the Build-up of Innovation Capabilities: Insights from the Global Value Chain Approach. *Asian Journal of Technology Innovation*, 15, 2, 151-160.
- Schmitz, H. (1995) Collective Efficiency: Growth Path for Small-Scale Industry. *Journal of Development Studies*, 31, 4, 529-566.
- Sey, A. (2008) *Where did all the Payphones go? Intermediaries, Innovation and Insecurity in the Mobile Phone Industry*. Paper presented at: ICA pre-conference on mobile communications, 21st May, Montreal, Canada, <http://www-personal.umich.edu/~parkyo/site/paper%20abstracts/Sey.pdf>.
- Sen, A.K. (1999) *Development as Freedom*. Oxford University Press, Oxford, UK.
- de Soto, H. (1989) *Other Path: The Invisible Revolution in the Third World*. HarperCollins Publishers, New York, NY.
- Southwood, R. (2007) *The Future of Voice in Africa*. Background Paper for the Future of Voice Workshop, ITU, Geneva. <http://www.itu.int/osg/spu/ni/voice/papers/FoV-Africa-Southwood-draft.pdf>.
- Sundaram, R. (2009) *Pirate Modernity, Delhi's Media Urbanism*. Routledge, London.
- Takahashi, Y. (2000) A Network of Tinkerers: The Advent of the Radio and Television Receiver Industry in Japan. *Technology and Culture*, 41, 3, 460-484.
- Tall, S.M. (2004) Senegalese Émigrés: New Information & Communication Technologies. *Review of African Political Economy*, 31, 99, 31-48.
- Tripp, A.M. (2002) *Changing the Rules: The Politics of Liberalization and the Urban Informal Economy in Tanzania*. University of California Press, Berkeley, CA.
- Ugor, P. (2007) Censorship and the Content of Nigerian Home Video Films. *Postcolonial Text*, 3, 1, 2.
- UN Habitat (2001) *Cities in a Globalizing World: Global Report on Human Settlements 2001*. Earthscan Publications, London.
- UNIDO (2002) *Industrial Development Report 2002/2003: Competing Through Innovation and Learning*. UNIDO, Vienna.
- World Bank (2000) *Cities in Transition: World Bank Urban and Local Government Strategy*. World Bank, Washington. [http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&siteName=WDS&entityID=000094946\\_00102805334064](http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&siteName=WDS&entityID=000094946_00102805334064).
- Wu, X. & Zhang, W. (2009) *Business Model Innovations in China: From a Value Network Perspective*. Paper presented at: US-China Business Cooperation in the 21st Century: Opportunities and Challenges for Entrepreneurs, 15th Apr, Indiana University, <http://www.indiana.edu/~rccpb/uschinacooperation/papers/P8%20Wu%20Xiaobo.pdf>.
- Zajc, M. (2009) Nigerian Video Film Cultures. *Anthropological Notebooks*, 15, 1, 65-85.