

Employment and the Mobile Sector in Developing Countries

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Abstract

Analysis of the growth of mobile phones in developing countries has mainly focused on the consumption of mobile phones and related services, analysing the benefits and patterns of mobile use (the demand-side). Another equally important component relates to the mobile sector (the supply-side) and the forms of supply and trading of mobile products and services.

The mobile sector has emerged as a significant part of the economy of some developing countries. It provides sizeable employment for those close to poverty, whether that is officially sanctioned agents and vendors, or more 'indirect' employment. For mobile sector enterprises, the configuration of the supply-side will determine how effective they are in connecting to customers, particularly when looking to extend their reach to the 'base-of-the-pyramid'.

The way that the mobile sector is configured is affected by the actions taken by policy makers, enterprises and other stakeholders. This paper provides an analysis and policy discussion, focussing particularly on the emergence and growth of more marginal micro-enterprises in the mobile sector.

1. A Summary of Mobile Sector Employment

Estimates suggest that the largest employment generation effect from the mobile industry in developing countries¹ comes from mobile sector employment, that is, the supply and trading connected to the mobile industry. There are a number of analyses which outlines of the extent of this employment, using data provided by mobile operators and consumer equipment suppliers (Deloitte 2008, GSMA 2008, GSMA & A.T. Kearney 2009, GSMLA & Convergencia Research 2007, Pyramid 2010)². Table 1, provides examples of employment in the mobile sector based upon recent figures gathered in four selected countries.

There are debates regarding the accuracy and comparability of such data (given that sub-sectors in the mobile supply chain tend to be counted differently or not at all). However, these figures clearly suggest that the mobile sector³ has emerged as a significant employer in many developing countries. Evidence suggests that mobile sector employment is continuing to grow, and that mobile markets have yet to become fully saturated with an increasing number of operators, handsets and services still emerging (e.g. see examples of Kenya, Bangladesh and Uganda (Deloitte 2008,

¹ This paper is particularly interested in focussing on low-income developing economies, although many aspects outlined also have relevance to lower-middle-income and upper-middle-income economies (World Bank 2003).

² We focus only on supply-side mobile sector employment directly concerning the mobile supply chain, seeking to understand technology-orientated practices on the supply-side of mobile. We will not analyse the employment created in non-mobile services, where spillover benefit comes from existence of a mobile value chain. See discussion of multiplier effects in (GSMA 2009, McKinsey 2006).

³ We take all direct activity in the mobile supply chain as being part of the supply-side of the mobile sector. This diverges somewhat from OECD approach to defining ICT production sectors (OECD 2009), in that the OECD excludes vending and retailing roles from its definition. However as we detail, in developing countries, actions and behaviours of such vendors very much reposition them as an active part of the sphere of production.

GSMA 2009, Ovum 2006, UCC 2007)). Taken together, it seems fair to estimate that mobile sector employment in developing countries employs at least tens of millions worldwide and is likely to continue to grow in the coming years.

Country/Year	Kenya 08	Pakistan 07	Bangladesh 07	Sudan 08
Employment in supply chain				
Mobile Network Operator (Direct operator employees)	2,861	11,000	9,380	2,740
Fixed Operator (Direct operator employees)	488	11,000	1,120	390
Network Equipment (Equipment supply and support)	2,444	4,000	13,180	1,450
Other Capital Items Suppliers	240	4,000	4,450	230
Handset Designers & Producers (Higher level handset production)	-	2,000	-	-
Support Services (Call centres, mobile repair)	38,286	2,000	3,100	2,440
Handset Distributors & Retailers (Stores and kiosks)	2,348	-	10,360	12,210
Airtime and SIM Distributors (Stores, kiosks, street traders)	141,530	144,000	39,930	16,980
CIC (Rural mobile information centres)	-	-	950	-
Total	188,197	178,000	82,470	36,440

Table 1: Levels of employment in the mobile sector in four selected countries, the rows in grey are those most likely to include more marginal employment. Adapted from (Deloitte 2008, GSMA 2008, Zain 2009).

Proportion of Mobile Employment Within Each Element of Mobile Value Chain

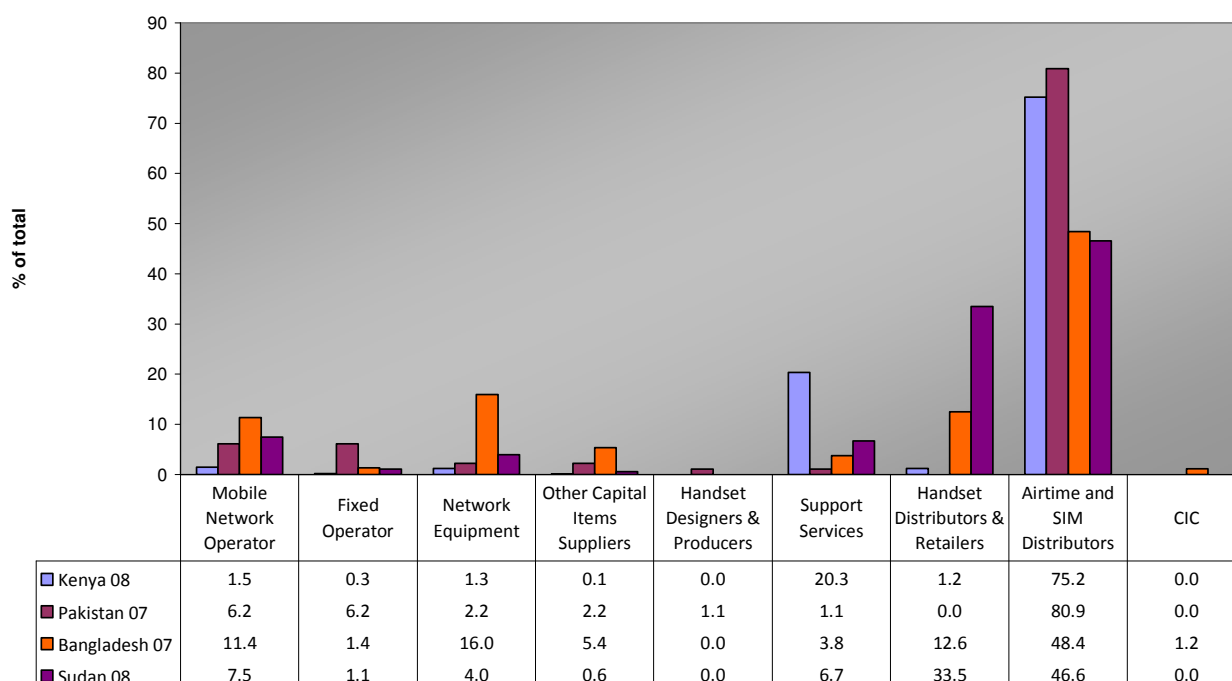


Table 2: Distribution of mobile sector employment nationally within each role of the mobile supply chain in four selected countries. Adapted from (Deloitte 2008, GSMA 2008, Zain 2009).

Whilst Table 1 shows the simple numerical extent of employment in selected countries, Table 2 depicts the relative distribution of total mobile sector employment

along the supply chain. Whereas formal roles such as internal management and telecoms equipment maintenance make up notable proportions, the majority of employment is created in roles which interact with more marginal customers. This involves handset retailers, airtime and SIM card distributors. Other literature suggests there are a number of further mobile sub-sectors, which may not be recorded in these operator influenced statistics, which also interact with more marginal customers and provide further employment. For example, mobile banking agents, second-hand phone selling, payphone operators, mobile rechargers and mobile repairs (MPESA 2010, Sivapragasam 2009). Thus, not only does the mobile sector employ millions in the developing world, but the majority of these jobs are created for those who are in marginal roles, or who interact with those in marginal positions, close to poverty.

As alluded to above, the ways and forms of the mobile sector in developing countries are quite different to those in the developed world, and have evolved according to the types of consumer they are trying to reach. Given this disparity, it would be unwise to simply transfer models and policy from developed to developing countries. There is a need to analyse the unique ways in which the mobile sector has grown in developing countries, and to focus on the importance of those in majority 'vending' roles sitting closer to lower income groups.

Beyond enterprise analyses, it is also prudent to analyse these 'vending' roles, from the lens of poverty relief and policy. Whilst there has been an increasing interest in how such enterprises can be a part of poverty relief, there are only a few examples of work (i.e. UNCTAD 2010) which have looked beyond policies related to growth and employment (Heeks 2008).

2. Understanding the mobile sector

Whilst quantitative work gives an indication of the extent of employment in the mobile sector, qualitative assessments can offer a more detailed view of the sector's makeup. In this section, we summarise three principal concepts that can be used to position such enterprise, focussing on the majority 'vending' roles outlined in the previous section.

Micro-enterprises but with interdependence – In developing countries, mobile sector employment predominantly emerges in micro-enterprises⁴, leading to a large number of independent micro-enterprises which each undertake one or several components of mobile provision, such as airtime reselling, handset selling or m-banking provision (Ilahiane & Sherry 2008, Lugo & Sampson 2008, Rangaswamy 2009a).

There are contrasting configurations of such micro-enterprises. On the one hand, there is the model of mobile sector micro-enterprises as 'agents', where there is some level of agreement between parties connected to vending, for example in m-banking or rural payphone schemes, the micro-enterprise follows some rules in order to receive preferential supply of goods or services (Keogh & Wood 2005, Knight-John et al. 2005, Mas & Morawczynski 2009, Morawczynski & Miscione 2008, Reck & Wood 2004). On the other hand, there is also a significant volume of 'indirect' mobile sector employment; those roles in the mobile sector which emerge that are more loosely coupled to formal enterprises without any contractual relationship, often connected

⁴ We follow the definition of micro-enterprise being an enterprise with 10 or less employees, often single owner-operator businesses, where products are sold into the market (Liedholm & Mead 1999).

through multiple intermediaries. This model fits with mobile repair or top-up card vending (Cheneau-Loquay 2008, CKS Consulting 2009, Mujica 2007).

Thus, mobile sector micro-enterprises can be considered to some extent to be independent entities, able to build strategies based upon improving margins or reducing enterprise risk (Rangaswamy 2010, Richardson et al. 2000). A degree of independence and ability to build strategy also connect with the ability to use and adapt mobile technology and surrounding service configurations in order to serve a specific strategy (Cheneau-Loquay 2010, Chipchase 2009, Tall 2004).

However, whilst it is important to consider the ability of mobile micro-enterprises to build independent strategies, these micro-enterprises (even those 'indirect' ones) sit within a wider framework, typically controlled by larger enterprises. External factors such as the infrastructure, strategy and policy conditions on larger enterprises, whose goods and services micro-enterprises use, influence micro-enterprise form. Thus, supply chains in the mobile sector strongly shape the viability of micro-enterprises' strategies in the longer term, for instance by determining commission margins, saturation of micro-enterprises and promoting specific products (Alam et al. 2010, Sey 2008).

Informality and instability – Informality is used to refer to elements of enterprise that for reasons of tax, licence, location, products or processes lie outside legal norms (Palmer 2004, Portes et al. 1991). Literature on informality has also increasingly focussed on how informal enterprise are connected to formal firms through outsourced and informal relationships (as is the case in the mobile sector). Within this understanding, informality should also include those roles "not recognised, regulated, or protected by existing legal or regulatory frameworks" (Chen et al. 2002 p.12).

In mobile sector micro-enterprises the level of informality is a key component in constituting the unstable settings in which micro-enterprise operate. The second part of the definition of informality above is crucial, in that even when mobile sector micro-enterprises are part of legitimate mobile supply chains and paying forms of tax or licence, instability emerges from the way that these enterprises are not fully protected through loose outsourced contractual relations and little recompense within their supply chains compared to more classic mobile outlets (Portes et al. 1991).

In addition to this instability created due to micro-enterprises having little power in supply chains, instability is also connected to external factors; notably wider technology trends in developing countries (such as the shift from shared towards individual ownership of mobile phones in some developing countries (Sey 2009, Sey 2008, Shaffer 2007)); problematic legislation, particularly technology policy, where micro-enterprise activity can occupy legal grey areas (Foster 2010, Pickens 2009); and local or municipal rules and institutional behaviours which orientate the local economic settings and livelihoods of mobile sector micro-enterprises (Foster & Heeks 2010).

Mobile sector micro-enterprises hence exist in highly unstable environments. Although innovation can emerge in response to such instabilities, too much instability is likely to lead to reduced viability of such enterprises in the long run.

Base-of-the pyramid (BoP) and the innovation – As has been outlined in studies of base-of-the-pyramid (servicing the large number of lower income citizens in developing countries as consumers), for formal enterprises looking to sell their products to the BoP, needs of the BoP are commonly served through interaction with

micro-enterprises (London 2007, Prahalad 2009). Micro-enterprises are able to follow strategic approaches which fit in with the experiences and needs of their BoP customers, and this is the case in mobile phone provision.

Mobile sector micro-enterprises through their close social connection to customers are able to understand local BoP needs, and they often survive by providing some type of innovative niche for locals (e.g. by breaking mobile top-up products down to fit with small incomes, shared or mediated phone use (Burrell 2010, Chipchase & Tulusan 2007, Goodman & Walia 2006, Rangaswamy 2009b)). Such niches are achieved through *socio-technical appropriations*. These can be technology changes (Barendregt 2008, Galperin & Bar 2006), but in many more cases relate to very small adaptations of technology, commercial practices, connected arrangements or use, where mobile products are used 'outside the instruction manual' in order to better serve the BoP (Chipchase 2009, Rangaswamy 2009a). Thus, these micro-enterprises are crucial actors in BoP provision in the mobile sector (Anderson et al. 2010, Anderson & Kupp 2008).

Such local appropriations can take on a life of their own. Innovation can be spread more widely through the local interconnections and customers of mobile sector micro-enterprises, for example within market spaces where micro-enterprises are closely linked (Lugo & Sampson 2008). Local arrangements and innovation can also move 'upwards', particularly when local innovations influence formal product services which absorb these local innovations (Goodman & Walia 2006, Hughes & Lonie 2007).

3. Mobile Sector Employment from a Policy Perspective

There are a number of points that can be made following the analysis in the previous section. Base-of-the-pyramid concepts clarify why the emergence of mobile sector micro-enterprises has been so marked; they are crucial to mobile provision in developing countries. It is only through their niche building and close proximity and relations with BoP customers, that the mobile industry can successfully and rapidly reach this crucial group of consumers.

In terms of the enterprises themselves, mobile sector micro-enterprises are plagued with instability connected to having little power within the supply chain in which they exist and little influence or visibility within wider policy making processes. However, in local environments it may be possible for micro-enterprises to respond to such instability whether that be through socio-technical appropriations or diversifying into other products and competing services.

Figure 1 shows a framework which outlines general directions of policy to consider with respect to enhancing the role and potential of mobile sector micro-enterprise, particularly with consideration to the instabilities already mentioned.

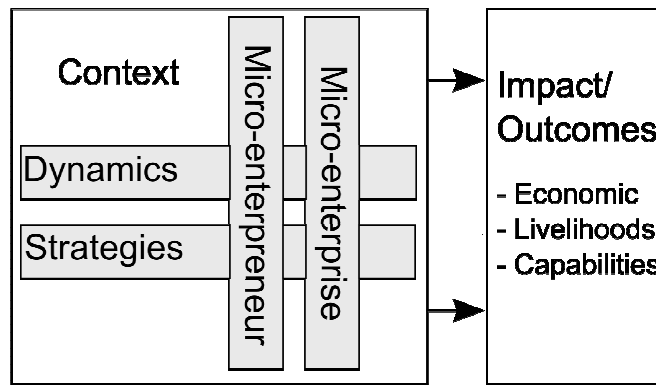


Figure 1: Wider perspective of mobile sector micro-enterprise in developing countries. Adapted from (Foster & Heeks 2010, Foster 2010).

i) Context – Wider informality and instability are a major cause of problems in mobile sector micro-enterprise which emerges from wider policy, particularly relating to technology. Also of significance is the local policy environment relating to economic settings and livelihoods of micro-enterprises and their employees. Local policies which clarify rules are likely to increase the predictability and stability of local settings, whilst wider technology policy could benefit from participatory work which looks to consider such mobile sector micro-enterprises.

ii) Enterprises + Entrepreneur – When examining the paths of growth for mobile sector micro-enterprise, policy considerations may look towards *value chain* theories and notions of *upgrading*. This is a mature area of study which examines policies and actions which enhance the ability of 'lower value' enterprises to move to 'higher value' roles within their value chains (Porter 1998).

However, it may be that the level of contextual instability and uneven power relations mean that enterprise upgrading in the value chains is not viable. Micro-enterprise development paths are seldom linear. Entrepreneurs who are part of micro-enterprises tend to move through a succession of different apprenticeships, roles or jobs that serve for the accumulation of skills, social capital or finance (Palmer 2004, Palmer 2007, King 1996). Equally, *occupation pluralism* positions micro-entrepreneurs as balancing multiple entrepreneurial roles simultaneously. This can relate to strategies of diversification, opportunist sidelines or seasonal work which reduce livelihood risk and increase income (Palmer 2004, Palmer 2007, King 1996, King 2001). As suggested in the earlier sections, similar non-linear 'jumping' and multiple role 'juggling' may also be strategies for dealing with instability in mobile sector micro-enterprises (Rangaswamy 2010, Rangaswamy 2009a), and this provides a more challenging position from which to understanding policies, and shifts the focus from enterprise towards individual strategy.

iii) Strategies + Dynamics – Policy making should not consider micro-enterprises to be passive receivers of policy or enterprise strategy. Being independent, they should be seen as active players who are able to negotiate their roles and situations. Strategy relates to how they handle the relations and flows within their local networks and supply chains; how they handle the technology and use it in their livelihoods, and the ways they 'jump' and 'juggle' between roles as outlined in the previous section.

In addition to strategies, given the instability of mobile sector micro-enterprises, the dynamics of micro-enterprises, how they are able to adapt and change strategies is also crucial. This relates to how micro-enterprises are able to enter the mobile sector and the path that might or might not include enterprise growth and development.

iv) Impact – To understand mobile sector micro-enterprise and its potential particularly related to poverty, policy should look not only to economic measures, but also the impact on livelihood assets and the wider livelihood environment, as well as the development of freedoms and capabilities (Sen 1999).

4. Case Studies of Mobile Sector Micro-enterprises and Policy

In this section we illustrate in more detail, using case studies, how this more adaptive understanding of mobile sector micro-enterprises is relevant to policy on the ground.

i) The importance of context and of minimising instabilities – Mobile handset policy in India⁵

In 2009, mobile operators in India began enforcing a regulation to reject network access to cheaper generic brand mobiles, which avoid fees and regulation by not assigning a unique internal identity (International Mobile Equipment Identity - IMEI). The goal of the regulation was to eradicate such phones, perceived to be both illegal and insecure to the telecom system

This seemingly minor regulatory change, turned out to be disruptive, having a larger negative effect on the mobile sector in India than anticipated. Although definitive statistics are not available, some reports suggest that up to 20 million (mainly BoP phone) users were affected as a result of the new regulation, with their phones unable to connect to any network. Whilst the government engaged in some publicity campaigns and implemented a mobile upgrade program to assist users to upgrade their phones prior to the deadline, it appears as if the program made only a small dent in the volume of phones turned off and there are suggestions that upgrades will not be technically viable in the long term.

This blocking of handsets also had a negative knock on effect on the reputation of mobile sector micro-enterprises supplying these niche products to BoP customers. In addition to income losses, the policy change threatened established networks of appropriation and repair amongst mobile sector micro-enterprises. Supply chains are a source of knowledge, learning, credit and social capital. Hence, whilst the regulation was aimed at securing the network, the sudden removal of these products and consequently the supply chain had a detrimental effect, not just on products but also networks that had been built over time by micro-enterprises.

Despite such disruptions, the goal of the policymakers - a reduction in unbranded handsets - may still not have been achieved. As outlined in the policy model, mobile sector micro-enterprises are rarely passive. In this case, they have actively tried to get around the regulation by offering informal (often illegal) upgrades to affected phones. More negatively, other accounts suggest that the new regulation may have had a wider detrimental effect on the confidence of mobile users, by muddying the trust relationship between mobile sector micro-enterprises and BoP customers. This may have wider negative effects on the confidence in mobile phones for some BoP customers.

In sum, whilst there was some inkling of the negative impact that regulation would bring, there has been little analysis, particularly related to the longer-term effects on mobile sector micro-enterprises.

This example is not an isolated incident. In fact, a number of similar security-focussed regulations are planned in other countries. Retrospective mobile sim card

⁵ This section is adapted from Foster 2010.

registrations, where unregistered sim cards will be deactivated from the mobile network following a registration deadline, have been instigated by governments in a number of developing countries, including Ghana, Kenya, Nigeria and South Africa (Sesay 2010). As in the Indian case, the most marginal customers (such as migrant and rural populations) will be most greatly affected by such rules and any loss of their ability to use mobiles will in the long term dent trust relationships of micro-enterprises who are crucial in mobile provision for these groups.

Implications for practice and policy

More participatory policy making which includes and motivates mobile sector micro-enterprises in partnership would ensure that they are implemented in a more coherent and far less damaging manner without disruptive effects on BoP provisions.

The point is not that the underlying justification for such regulatory change is necessarily misguided⁶, but that it is important to understand the implications when such regulations are implemented. This relates particularly to the nature of regulation, for which technical measures have been used to block mobile access on-mass.

ii) Unpicking strategies of innovation in mobile sector micro-enterprise

In this section the case of the leading mobile money service in Kenya, M-Pesa is used to illustrate both the potential and the pitfalls that emerge with respect to strategies of local innovation, particularly looking through the lens of larger enterprises who interact with the BoP.

Case: M-Pesa – The early years

The M-Pesa service was originally developed by the Vodafone Group in partnership with DFID in a project entitled "Mobile Micro-Finance". Its goal was to simplify the repayment of micro-finance loans (DFID 2006). It was only during the pilot phase and analysing the practices of M-Pesa agents and users in Nairobi, that the wider form of the service we presently know came to exist (Hughes & Lonie 2007).

A key element in this early trial was the way in which it was conducted. The project could easily have been designed as a closed technology project, focussing solely on micro-finance transfer and building on this. Instead, aspects of the pilot design (both in terms of the mobile agent freedom and technology) allowed micro-enterprises and users some freedom to innovate locally. This led to production of local innovations and it was in the enlightened analysis during the pilot that the potential of mobile money in its present form as M-Pesa emerged. Local innovation in the project was influential in pushing M-Pesa towards its current form (Hughes & Lonie 2007).

Case: M-Pesa – Local innovations

Innovation of these kinds of services is necessarily highly local. In the authors' research in Nairobi, this is illustrated through the diversity of M-Pesa use by various agents in the vicinity of one another. In a slum area, M-Pesa predominantly provides a service for sending urban to rural remittances – in line with the way that M-Pesa is marketed. In an area of small-scale production, with a high proportion of migrants from neighbouring countries, M-Pesa use is often centred on long distance payment for goods. Finally in a local trading centre, some M-Pesa agents found themselves becoming the 'community night safe' where traders deposit their floats into M-Pesa at the end of the day, withdrawing them again the following morning. In sum, even when

⁶ Such retrospective regulation points to the need for further research to understand why the original policy was constructed or implemented in a suboptimal way.

a designed product is brought into use, local innovation 'in use' emerges according to local needs.

Implications for practice and policy

Pre-launch stage - *Funding streams and research should be more focussed towards analysis of present use. Policy makers and designers need to reposition themselves less as 'planners' and more as 'searchers' of local innovation, focussing on understanding and analysing how local users innovate (Heeks 2010).*

For commercial organisations, this may mean being flexible in terms of project goals and moving beyond direct metrics as a measure of success. Donors and agencies need to ensure that narrow project designs and funding criteria do not negate the value of local innovation and unintended outcomes which might have positive impacts.

Ongoing innovation in use - *Policy makers need to be careful in the regulation of service. Although it might be tempting to lock technology into a particular model in use, providing more flexible frameworks can allow local innovation.*

More flexible policies ensure that local innovation is not constrained by regulation and can be scaled up without long delays. In Kenya, for example, mobile operators are now part of a 'unified licence framework'. Such licences, which are technology agnostic, allow more flexibility than the older form of licences, where providers were awarded a licence to offer a particular technology (e.g. licensed for telephone network but not VoIP). These were seen to have prevented innovative services due to their restraints (Waema et al. 2010).

Plurality and locality of innovation means that when unexpected services emerge they require adaptive responses from both the commercial partners and policy makers.

For example, take one of local innovations mentioned above. For the M-Pesa agents, the 'community night safe' local innovation brings much risk. Whilst M-Pesa is adapted to absorb uneven flows of money (Mas & Siedek 2008), the design is not sufficient when agents find themselves flush with end of day floats in the evening, often when banks are closed. The service puts agents under personal risk of losing money or being robbed, and indeed there are several reports in Kenya of such attacks⁷. In slum areas in Nairobi, potential M-Pesa agents report that these risk factors are one of the principal reasons why in such areas there are often fewer M-Pesa outlets. Thus, when one does not adapt to local innovation this may limit roll out of mobile services, in this case restricting the ability for M-Pesa to reach the poorest urban areas⁸. In this example, local innovation should instigate discussion regarding policy and practices which would reduce the agent's cash holdings.

⁷ It is difficult to ascertain how serious the level of such robberies is since the connection to being an M-Pesa agent is not always made. However, in the last 6 months, the weekly security update of one Kenyan security firm recorded four such significant incidents with loss of the equivalent of several thousand dollars in two of these cases.

⁸ Similar issues to this are also alluded to in other research on M-Pesa. "Agents therefore face a non-trivial inventory management problem, having to predict the time profile of net e-float needs, while maintaining the security of their operations (Jack & Suri 2009 p.8)

iii) Upgrading dynamics of mobile sector micro-enterprises and entrepreneurs

One of the most successful models when analysing interconnected micro-enterprise supply chains is to consider the role of 'upgrading', the ability of certain groups, in this case the lower value roles taken by mobile sector micro-enterprises to improve their position within the 'value chain' (e.g. moving to roles which improve their potential for profit, stability or learning (Porter 1998). We analyse how relevant such approaches might be for mobile sector micro-enterprises in Kenya.

Figure 2 shows an overview of the mobile vending value chain in Kenya. On the surface, there is little evidence of any widely followed paths of upgrading. At the lowest level, informal micro-enterprises lack the finance to become formal vendors. For vendors, it is difficult to build the business connections and skills to become a higher level distributor or dealer. Thus, typically in Kenya each of the value chain roles reflects more established relationships within the informal economy. Dealers are well connected businessmen; middle-men tend to emerge from existing ranks of distributors in other sectors. Informal entrepreneurs lack significant capital to upgrade, although often with some secondary education and some technical knowledge thanks to Kenya's education policies.

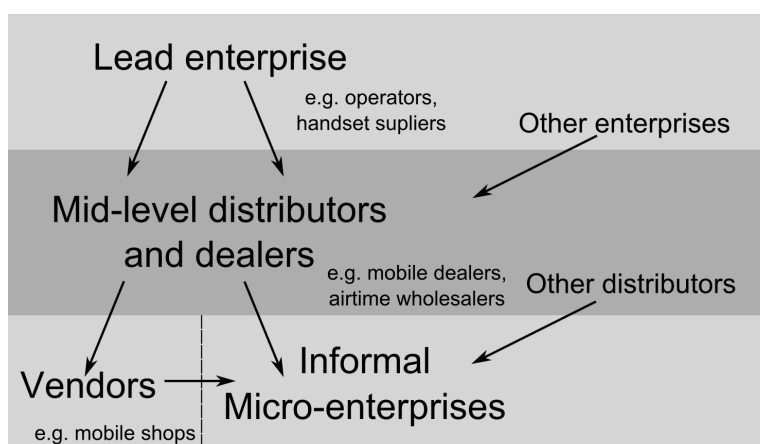


Figure 2: Overview value chain of mobile vending. Source: Authors fieldwork

However, Figure 2 also provides insight on how active micro-enterprises and micro-entrepreneurs in the mobile sector can upgrade. At each layer of the value chain there are other value chains of competing mobile enterprises and distribution, giving potential for more subtle upgrading through role 'jumping', or 'juggling' multiple products. At a macro level, the emergence of many of these opportunities stems from policy which has pushed mobile competition in Kenya. This increase of mobile competition has spurred enterprises in the mobile sector to expand the range and types of service they offer in order to maintain competitiveness (UNCTAD 2010). In some areas this has squeezed micro-enterprise profit margins, but in general it can be argued that competition has had net benefits to mobile sector micro-enterprises.

We detail upgrading in Kenyan mobile sector micro-enterprises, drawing on a wider model of the ways in which micro-enterprises might upgrade (Humphrey & Schmitz 2002, USAID 2006), as outlined in Table 3 and expanded in the preceding section.

Type of upgrading	Description of upgrading	Factors relate to upgrading in Kenya (positive & negative)
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Process	"Transforming inputs into outputs more efficiently by reorganising the production system or introducing superior technology" (Humphrey & Schmitz 2000 p.3) We equate this to how mobile sector micro-enterprise can increase value or profits with the value chain.	Producer-driven value chains • Lead enterprise strategy squeezes margins and causes instability of micro-enterprises • Potential of joint actions
Product	<i>Improving the quality of products available to customers</i> Provision of reliable service and trustworthy goods, increasing quality to customers.	• Ensuring trust in micro-entrepreneurs • Offering increasing range of mobile products & services • Exploiting new mobile services emerging
Functional	<i>Repositioning an enterprise within different functions in value chains can provide improved control and profitability</i> Cutting out middlemen and increasing role of mobile sector micro-enterprise in 'middleman' roles	Well established middlemen unlikely to be displaced
Channel	<i>Ability to upgrade through diversifying into different value chains</i> Moving from local to global chains or selling to different customers in term of socio-economic status.	• New mobile services could allow micro-enterprise to cater to middle-class customers • Moving into regional trading supply chains

Table 3: Summary of types of upgrading and their potential for mobile micro-enterprises in Kenya. See full description below

Process upgrading

In Kenya, value chains in the mobile sector are 'producer-driven' where micro-enterprises are highly dependent on their formal supply partners (Gereffi 1999). Thus, for mobile sector micro-enterprises margins are dependent on others in the value chain, which limits process upgrading. For example, mobile airtime vending is becoming a less viable product for micro-enterprises due to the increasing price competition in the industry. Operators have looked to reduce commission levels in the value chain to reduce costs, with interviewees suggesting that this means that margins have dropped from 10% to 4-6% over the previous year, as competition between operators has increased.⁹

There are also examples of strategies within producer-driven chains having similar effects on mobile sector micro-enterprise; operators increasing the number of micro-enterprise suppliers of their products which reduces demand at each micro-enterprise, new enterprise products which pull profit from informal schemes run by micro-enterprises (such as operators introducing lower denomination airtime cards which limits similar informal schemes) and reduced support for older products (such as the decline in support for shared phone services in Kenya). Whilst some of these changes may be beneficial in terms of the end-user, here we simply illustrate that mobile sector micro-enterprises are greatly affected by changes beyond their control and are thus prone to instability which greatly disrupts their operations.

⁹ Whilst Safaricom and its' M-Pesa service still have a significant majority share in mobile and mobile money respectively, there are now three other strong competitors Airtel, Orange and Yu in Kenya. All have in recent times massively reduced their mobile prices in competition for market share. Each of these competitors has also launched competing mobile money services.

In other industries where producer-driven chains are present, lower-end enterprises have sometimes been able to improve their bargaining position through combining together to negotiate within their value chains (Schmitz 1995). In Kenya as yet there is little evidence to suggest this has happened, perhaps due to the diversity of different handsets, operators, and mobile money schemes which complicates joint action.

Product Upgrading

Product upgrading particularly highlights the importance of mobile sector micro-enterprises preserving their reputation of being seen as legitimate and quality vendors both to customers and within the value chain. In Kenya sellers of low quality mobile products, aggressive hawkers and other unscrupulous behaviours do nothing to support the reputation of mobile sector micro-enterprises.

There are a number of possible ways to support initiatives which improve quality. Where micro-enterprises are more clustered, such as in the case of urban handset vendors and repairers, local associations might be able to provide some policing of quality and behaviours. In a Nigerian computer reseller cluster, such an association was able to somewhat improve and standardise quality amongst its members (Oyelaran-Oyeyinka 2007). There is also room for policy here to ensure standards of behaviour. In mobile money in Kenya for instance, policy to outline roles and responsibilities of m-banking agents (signage, rates, and qualifications) can be seen to push the value chain to enforce standards in order to preserve reputation of value chains (Dias & McKee 2010).

Product upgrading also connects to how micro-enterprises are able to offer a wider range of services for their users' needs. There is some evidence of adaptive enterprises who are able to 'juggle' an increasing range of mobile technologies. For example, sim card sellers complementing their selling with mobile accessories and more technically skilled mobile sector micro-entrepreneurs moving into more lucrative mobile repair services (Rangaswamy 2010).

The shifting market offers further opportunities for product upgrading. At present the mobile market in Kenya is in flux, with a nearly daily expansion of mobile technologies and services. This is closely connected to the increase in competition in the mobile sector in Kenya, particularly to mobile operators, who need to expand and find new value-added services in order to maintain profits and loyalty.

There is potential for mobile sector micro-enterprises to take advantage of this range of new products, in areas such as entertainment (e.g. downloading of ringtones), mobile money services (e.g. being an agent for services which sit on top of mobile money) and data (e.g. configuring and advising on data use). There is anecdotal evidence that some mobile sector micro-enterprises have been able to grow by offering such services. However, whilst there is potential in this type of product upgrading, it appears to be underexploited.

Some operators and equipment suppliers interviewed are launching initiatives to support such product upgrading within value chains, keen to exploit the existing knowledge of their value chain as they promote new products. Further, these enterprises are increasingly aware of the risks of micro-entrepreneurs jumping to competitors if they fail to achieve a profitable livelihood. Thus, competition policy has had an indirect effect on improving mobile sector micro-enterprise relationships in the value chain. There is also some early evidence in Kenya that government can contribute to supporting such product upgrading. The 'Digital Village' scheme launched

by the ICT Board of Kenya, still in the early stages, is seeking to work with existing ICT micro-enterprises and support them through loans and training to build digital centres in rural areas.

Functional upgrading

In interviews in Kenya, there is some discussion amongst mobile industry players that reducing the role of mid-level dealers and distributors would benefit both mobile sector micro-enterprises and formal enterprises alike. However in Kenya there seem to be few potential structural alternatives by which this could happen. Mid-level suppliers have built strong social and financial relationships over time to which there seems to be no obvious alternative at present.

Channel upgrading

Diversifying from solely buy-sell and BoP sale might lead to building of skills and/or improved products for mobile sector micro-enterprises in Kenya. One example where such upgrading might be possible is connected to mobile money in Kenya. There are many services looking to take advantage of the growing popularity of such services. The M-Kesho service launched by Safaricom and Equity Bank, allows M-Pesa accounts to be connected directly to a bank account. For agents, this new service offers the potential for M-Pesa agents to channel upgrade to become 'branchless banking' agents and to offer new products. In this case, agents (in addition to offering product upgrading for existing customers) will increasingly be catering for new, higher income banked customers, and this channel upgrade offers new opportunities for growing their enterprises and building skills and reputation.

Channel upgrading can also be connected to wider policy decisions. In 2009, Kenya reduced the VAT rate from 16% to 0% on mobile phones to stimulate the local market. Many mobile handset sellers, particularly in urban centres now find themselves becoming less reliant on local customers and instead a part of regional supply chains, where their products are sold into other East African countries due to the lower costs related to VAT. This change has not been well received in Uganda (Mugabe 2009), suggesting that regional cooperation might be useful. In Kenya, however, the new markets and demand have provided an impetus for an upgrade in quality of service and goods as well as the management in these micro-enterprises, which are likely to push growth.

Implications for practice and policy

As can be seen, there are some upgrade possibilities for mobile sector micro-enterprises which could be beneficial to livelihoods and skills development. However, in Kenya such possibilities emerge unexpectedly or as spillovers of other processes of policy making and strategy. In other sectors of the informal economy, there have been schemes which have attempted through coherent partnerships of government, the private sector and NGO's, to upgrade large groups of entrepreneurs and have wider economic effects (USAID 2006). *Without such coherent partnerships is policy and action, the effects of such upgrading are likely to remain highly sporadic.*

However whilst such wide scale enterprise upgrading is less viable, it is important not to underplay the more subtle upgrading through entrepreneurs in the mobile sector, 'jumping' between and 'juggling' roles over time as suggested in the policy framework above. *Such entrepreneur upgrading still has impact in providing more stable livelihoods and acquisition of skills which may lead to longer term improvement of the position of an individual entrepreneur.* As outlined in this section, in Kenya the availability of opportunities for mobile micro-enterprises diversification tends to

increase with competition, as organisations look bring in new products and services. Additionally in line with Anderson et al. (2010), in Kenya competition has resulted in an increasing focus on more marginal customers, making mobile micro-enterprises a valuable partner to enterprises higher up the value chain.

5. Summary: Three Policy Approaches

As illustrated in Figure 2, in developing countries, a large proportion of employment in the mobile sector relates to the supply of mobile goods to more marginal customers. We argue that these micro-enterprise roles are crucial for two reasons. They are central in the provision of widespread access to mobile services in developing countries and they provide growing employment for marginal groups in developing countries.

Whilst it is difficult to infer wider policy implications from our cases, they indicate the challenges and potential of mobile sector micro-enterprise, from the perspective of two countries, India and Kenya, where mobile policy and the market are comparably at a relatively advanced stage.

i) In terms of context, ***mobile sector micro-enterprises need to be better considered in policy and research***, considering their importance in enabling the wider spread of mobile to the most marginal groups as well as providing livelihoods.

In research this relates to more concrete work on understanding the role of mobile sector micro-enterprises: operators and governments to determine the numerical extent of such employment; wider coordination to ensure comparability of data, and inclusion of ICT micro-entrepreneurs as a separate category within informal sector and other surveys.

Within SME, environment and urban policy making, there has been an increasing movement towards more participatory policy making, including and working with informal sector representatives within policy processes (Hordijk 2005, Jeifetz & Rodríguez 2003). Similar approaches to policy making should allow inclusion of similar voices in ICT policy.

ii) We have illustrated that mobile sector micro-enterprises are closely connected into BoP innovation through their local strategies and innovation. Local innovation, spread through local diffusion or captured by formal enterprises can create large new markets for wider growth of enterprise. However, **innovation policies need to adapt both internationally and locally to capture and support the potential to harness and adapt to local innovations.**

For bodies supporting global innovation, local innovation processes ask fundamental questions of ecologies which support innovation. In his influential work on user innovation, Von Hippel(2005) highlights some of the wider policy issues. Moving innovation policy and incentive away from R&D and lab-based product creation toward co-design with user and improving methods to making such local innovation more visible is crucial.

In Kenya, local policies which support flexibility in use such as technology independent licensing, provide leeway to allow service providers to more easily adapt their services according to local use. For operators and enterprises, looking toward 'lead micro-

enterprises¹⁰ and how products are appropriated and used can provide glimpses of potential improvements and new products, as illustrated in successful mobile sector cases in developing countries (Goodman & Walia 2006, Hughes & Lonie 2007).

iii) Micro-enterprises are part of value chains, yet there is little evidence that upgrading offer a widespread way for micro-enterprise to build development assets. **Analysis and policies which acknowledge entrepreneurs in the mobile sector jumping between employments and juggling of multiple roles can provide a useful framework for understanding how the mobile sector could be part of sustainable livelihoods and poverty reduction.**

As outlined above, this connects to policies which encourage strong competition within the mobile sector, and pushes competitive innovation and strategies for reaching the base-of-the-pyramid. In these cases, mobile micro-enterprises are likely to have more opportunities, both in terms of services available to them, and in their relations along the mobile sector value chain.

Work which looks towards interventions with mobile sector micro-enterprises should include wider conceptions of impact beyond the purely economic ones. Rather than simply considering how to move such enterprises from the informal to formal sector which evidence suggests will be difficult, it may be more feasible to focus on enhancing the positive impact through increasing employment, reducing micro-enterprise instability and building transferrable skills.

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¹⁰ This is an adaptation of Von Hippel's notion of lead users (Von Hippel 2005) - More advanced micro-enterprises which are likely to be at the vanguard of local innovation processes

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