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Telecom Reform and Poverty Alleviation in Kenya

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Abstract

Eradicating poverty is perhaps the single most important global development challenge. As rural areas are typically home to the majority of the poor in developing countries, the success of poverty alleviation interventions in rural areas will be important in determining if this challenge is met. This paper examines the relationship between telecom reform and poverty alleviation in Kenya, documenting how investments in poverty alleviation are made significantly more effective if basic telecom network services are available. It demonstrates that ICTs have the potential to maximize the multiplier effect of rural poverty interventions by empowering disadvantaged individuals and improving their immediate economic environment. In this context the national telecommunications policy framework and its impacts on the accessibility and affordability of ICTs in rural areas is increasingly important to poverty alleviation institutions. As a case study, the reform of the telecommunications sector in Kenya and its implications for that country's rural poor are assessed. It is concluded that the current policy and the market structure it has created is resulting in a bypassing of rural areas in terms of access to ICTs and suggests some remedies for this situation. Finally, it is recommended that, given the importance of ICTs to their work, poverty alleviation institutions should consider making low cost investments in ICT infrastructure when appropriate while using their leverage as possessors of development assistance funds to lobby for changes in telecommunications sector policy regimes that hinder access to ICTs in rural areas.

Introduction

The Johannesburg Plan of Implementation produced at the 2002 World Summit on Sustainable Development states that "eradicating poverty is the greatest global challenge facing the world today and an indispensable requirement for sustainable development, particularly for developing countries." The Summit set a target for halving the proportion of the world's people who live on less than $1 per day by 2015. This challenge is particularly acute in Sub-Saharan Africa where large proportions of the population live under this poverty line. For example, for the Sub-Saharan region Kenya is considered to be relatively well off economically. Yet according to the 2002 UNDP Human Development Report, 26.5% of the country's population lives on less than $1 per day and 62.3% live on less than $2 a day. The situation is even worse in the region's rural areas, typically home to 75 – 80% of African countries' populations. Using the case of Kenya again, the country's 1997 Welfare Monitoring Survey found that the incidence of food poverty[1] in Kenya's rural areas was 51% as compared to 38% in its urban areas.

Institutions that are involved in rural poverty alleviation efforts in Africa, whether they be governmental, non-governmental, or international organizations, therefore have a significant task before them. In a world of scarce resources in terms of time, money, and manpower, all institutions have to make allocation decisions to deploy these resources based on where they believe they can generate the greatest "return". Poverty alleviation institutions are no different, although their "return" is measured in terms of reducing poverty rather than a more familiar measure such as return on invested capital.

As McCormick (2002) and Mutahi (2002) both note, there are a number of factors that need to be considered when assessing sites for successful poverty alleviation interventions. Criteria identified by these authors include the presence of functioning stakeholder groups that bring local parties together, the size of the intervention target group and the relative level of poverty

[1] Food Poverty refers to those whose expenditures on food are insufficient to meet the FAO/WHO recommended daily allowance of 2,250 calories per adult.

within it, the state of local infrastructure, the economic potential of the area, and the presence or lack of local institutional barriers such as excessive bureaucratic red tape. This paper argues that in addition to these more traditional criteria, as information and communications technologies (ICTs) become ever more central to human activity, the local state of communications infrastructure will become an increasingly relevant consideration when choosing among intervention sites.

In its proposal[2] for a formative research project to explore the use of ICTs to alleviate poverty in rural towns in Kenya, South Africa, and Mozambique, BEES Consulting Group argues that:

> Poverty alleviation interventions, by and large, have tended to focus almost exclusively on empowering disadvantaged individuals without reference to these individuals' immediate economic context. This is unfortunate. Clearly, if the latter is languishing, vulnerable and less capable individuals and groups operating under such conditions will find it exceedingly difficult, if not altogether impossible to achieve material gains in living standards. Thus, it becomes important to tackle poverty alleviation at both levels simultaneously and with a more integrating perspective in mind. (Bees Consulting Group, 2001)

In this context ICTs have potential to make major contributions both at the level of the individual (training, access to information), the economic environment (improved market access and linkages), and integrating the two levels (aiding local government and local economic development planning). Of course ICTs are not the only input that can help to achieve this, nor can they accomplish this in isolation, but it is argued that they will have an increasingly important role to play in poverty alleviation projects and their success.

In order to best understand why this is so one needs to look beyond the direct impact of ICTs and understand that they make possible "the access to information that lies at the heart of most human activity" (WSIS Executive Secretariat, 2002). Moreover, ICTs have the ability to be customised for personal needs and local conditions (Digital Opportunity Initiative, 2001). This is relevant with regard to poverty alleviation efforts as while access to telephones or the Internet cannot be considered a basic need of the poor as compared to food, water, shelter and sanitation; access to ICTs does provide the poor with a potential means to escape their poverty (Kenny *et al*, 2001). This potential can take many shapes, including income-generating opportunities that were not previously possible, improved skills through access to distance education and training programmes, better planning and provision of services by local government, and access to market and price information. Furthermore, as Kenny *et al* (2001) note, the poor recognize this potential and are willing to spend over two percent of their income on telecommunications alone. A study[3] cited by these authors found that the poor in Chile spend about the same amount on telecommunications as they do on electricity and that the average Chilean spends more of their income on telecommunications than on electricity and water combined.

ICTs may even offer some of their greatest benefits in rural areas where the majority of the world's poorest people reside. For many rural dwellers, information transfer currently requires geographical proximity. Information on market price, credit and financing opportunities, and access to new technologies or government services is difficult to procure. For these people, access even to the most basic ICTs can make a significant difference. (Grace *et al*, 2001).

This ability of ICTs to leverage the efficacy of poverty alleviation interventions by impacting both the level of the individual and their broader economic environment argues for the inclusion of ICT accessibility and affordability considerations to the target population when

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[2] The primary and secondary research for this paper was originally performed in January-February 2002 for Bees Consulting Group. BEES is a development oriented consulting group that supports small enterprise development in Africa and is based in South Africa. The research was commissioned by BCG as background for a project it was preparing that aims to make use of ICTs to alleviate poverty and stimulate local economic development in rural towns in Kenya, South Africa, and Mozambique. The author would like to thank BCG for its permission to use this background research for the purposes of this article.

[3] De Melo, J., (2000). Telecommunications and the Poor. Internal World Bank Report. Washington, D.C.: World Bank

designing project interventions. It is not being argued that poverty alleviation projects should designed or their locations chosen solely on the basis of ICT criteria, rather that in a world of declining development aid (official development assistance declined by a third in real terms during the 1990s) the potentiality for ICTs to maximize the "multiplier effect" of poverty alleviation projects should be more explicitly considered. All else being equal, those locations with access to ICTs are likely to see better results from poverty alleviation interventions than those without access to ICTs. Recognition of this reality is already reflected in resource allocation decisions in other sectors as actors come to understand the impact that the presence of ICTs can have on their investment returns.

It is increasingly acknowledged that a telecommunications policy framework based around competition and independent regulation is important not only for the health of ICT sector, but also for the competitiveness of other sectors and the national economy as a whole (World Bank, 2001). Less attention however has been paid to the effect that telecommunications policy frameworks can have on accessibility of telecommunications services to the poor as it relates to poverty alleviation initiatives. If access to telecommunications services is not available or affordable in poverty stricken rural areas then institutions with poverty alleviation objectives cannot take advantage of the multiplier effect that ICTs have the potential to offer. Furthermore, if policy frameworks lead to uneven roll-out of telecommunications services nationally and institutions executing poverty alleviation efforts act in a rational manner and operate in the islands where such services are available, certain localities could be caught in a poverty trap that is in part caused by the telecommunications policy framework.

This paper will examine the Kenyan ICT sector as a case study in order to review how the recent restructuring of the country's telecommunications sector's policy regime has impacted infrastructure roll-out and tariff structures. This review will carried out with a focus on the implications of these effects on the rural poor[4]. Specifically it will examine:

- The negative effects the policy framework is having on the accessibility and affordability of telecommunications services in rural areas, and
- the limiting effects that this outcome exerts on the options available to poverty alleviation projects, in terms of project design and location, that would hope to make use of ICTs so as to maximize the impact of their efforts.

Towards this end, this paper will take an in-depth look at the Kenyan telecommunications policy environment, the Communications Commission of Kenya (the industry regulator), Telkom Kenya (the country's monopoly fixed line service provider), the proposed Regional Telecommunications Operators (RTOs) and the country's rural telecommunications policy, the mobile telephone operators, the Internet Service Providers (ISPs), the cyber cafes, Very Small Aperture Terminal (Satellite), and digital radio sectors.

Background

The telecommunications sector in Kenya falls under the jurisdiction of the Ministry of Information, Transport, and Communications. The Kenya Communications Act (1998), which went into affect on July 1st 1999, established a National Communications Secretariat within the Ministry to serve as the policy advisory arm of the government on matters relating to the communications sector. Under the Communications Act the Communications Commission of Kenya (CCK) serves as the regulator for the sector, the Appeals Tribunal serves as the independent arbitrator, and Telkom Kenya Ltd. and other licensed network operators serve as public communications operators (CCK website).

Kenya's telecommunications sector has only recently begun the process of liberalization, privatization, and independent regulation. The Kenya Posts and Telecommunications Corporation (KP&TC), which was a state monopoly responsible for the provision of telecommunications and postal services as well as the regulation of these sectors, was split into two parastatals and an independent regulator three years ago. The newly established

[4] For a review of telecommunications policy reform in Kenya (and its neighbors) that is focused on the long term sustainability of the telecommunications sector itself, please see the Evolution of telecommunications policy reforms in East Africa: Setting new policy strategies to anchor benefits of policy reforms by Muriuki Murethi also in this edition.

CCK is faced with the difficult task of being an independent regulator in an environment where an overall ICT framework to guide its policy decisions and to help it resist pressures from the monopoly operator and national government does not yet exist. Furthermore, the body lacks the technological resources necessary to monitor compliance with its regulations and often struggles to convince the private sector to provide it with statistics necessary to make informed decisions.

According to a October 2001 CCK press release, the government is currently working on drafting an ICT sector policy to guide industry in the application of suitable technology to boost access to communications in Kenya. However, most industry observers believe that the development of a national ICT framework and large scale changes in the sector will not occur until after the national elections scheduled for December 2002. And it is doubtful that ICTs would be at the top of the agenda for an incoming government. Despite the lack of a comprehensive national framework, the Kenyan Government is increasingly aware of the potential uses of ICTs to tackle its national problems of development. Both National Poverty Reduction Strategy and National Development Plan documents, which are currently being drafted, will have chapters devoted to the use of ICTs to tackle poverty and development respectively. The 2001 Poverty Reduction Strategy Paper is most encouraging as it sees the "develop[ment] of a regulatory/legislative regime that fosters the growth of…[and] formulates incentives for the IT industry" as a priority activity (Ministry of Finance and Planning, 2001).

In order to make telecommunications services more widely available Section 3.4.1 of the CCK's December 2001 Telecommunications Policy Statement contains a universal service goal which "emphasizes the provision of basic postal and telecommunication services to all unserved or under-serviced areas at affordable rates". All licensed operators are expected to contribute towards this goal and the CCK commits to putting licensing procedures in place to ensure compliance with this objective. However, as will be seen below the enforcement of these commitments has provided difficult on multiple occasions.

Regulator

The 1998 Kenya Communications Act current serves as the policy framework for the telecommunications sector in Kenya. The Act split the former Kenya Posts and Telecommunications Corporation (KP&TC) into three bodies: the Postal Corporation of Kenya, Telkom Kenya Ltd., and the CCK. Under the Act the CCK discharges functions in the area of licensing, price regulation, type approval of equipment, manages radio frequencies, interconnection between operators, and the fulfillment of universal service obligations.

The relative youth of Kenya's regulator is occasionally apparent. The organization is currently housed in temporary buildings until its new state-of-the-art headquarters are completed by the start of next year. Officials at the CCK have also expressed frustration with the unwillingness of both the ISPs and cellular phone operators to release subscriber figures to the body - thus preventing the tabulation of accurate national figures for the use of ICTs. At the present time the CCK still suffers somewhat from the phenomenon that African Telecommunications Union (ATU) Secretary General (and former head of KP&TC) Jan Mutai describes as "regulatory capture". This is a situation where the national operator has been in existence for far longer than the country's regulator, drafted the legislation that led to the creation of the regulator and the present structure of the sector, and has the resources to attract greater talent than does the regulatory body[5].

The fits and starts experience of the establishment of Kenya's Internet Exchange Point (KIXP) gives an insight into the process by which the CCK is attempting to escape this state of capture and become a truly independent regulator. An Internet exchange point (IXP) acts like a clearinghouse for local Internet traffic between ISPs. Without a local IXP a user in Kenya wishing to send an e-mail to a user at another Kenyan ISP, or wanting to access a locally hosted website, would have their data/request transmitted via North America or Europe. This routing drastically slows the speed of intra-country traffic and raises the cost of local data transmission. In response to this problem, the Telecommunications Service Providers

[5] The third element of this phenomenon would probably apply more to the country's two mobile phone operators (who have attracted much of the talent in the sector) than to Telkom Kenya.

Association of Kenya (TESPOK) approached the CCK about setting up an IXP and claimed that they received verbal permission to do so from the regulator. However, when the IXP was established in December 2000 the CCK deemed it illegal as it "lacked a license" and disconnected the facility after receiving a written complaint from Telkom (ITWeb Article, 14/12/2000).

TESPOK filed a license application for the IXP in March 2001 and when Telkom did not set up a facility to handle the in country routing of local Internet traffic, the ISPs were finally able to get the KIXP licensed in November 2001 and operational as in April 2002. This was after the CCK Board ruled that the service was a peering mechanism that allowed for the exchange of local traffic and was not an international gateway and therefore did not violate Telkom's monopoly on international Internet backbone traffic[6] (CCK Press Release, 11/29/2001). The history of Kenya's IXP would indicate that CCK is still subject to Telkom's influence when regulating the telecommunications sector. However, if Telkom is clearly not taking action to address an obvious need of the sector, it appears that the CCK will allow the private sector to step in.

The ultimate establishment of its independence by the regulator has important implications for the use of telecommunications services by the poor in the Kenya. Income alone explains 78 percent of the variation in the number of telephone lines and a similar percentage in the variation of access to the Internet per capita across countries and remains by far the best predictor of the comparative level of ICT rollout across and within countries (Kenny *et al*., 2001). In this context actions taken by the regulator to reduce tariff levels will help to combat this income effect and thereby make telecommunications services more accessible to the poor. This will only happen in Kenya if the CCK is making decisions based on the public interest and not in response to political pressure brought to bear by Telkom. The case of the CCK's (eventual) licensing of an IXP in Kenya is a useful example of the benefits that can accrue from independence as the IXP will increase the speed of intra-country traffic (less time on-line means less local phone call charges to access the Internet to the user) and reduce the costs of local data transmission among ISPs (savings hopefully to be passed on to users).

Telkom Kenya Ltd

Following the implementation of the Communications Act in July 1999, Telkom took over all telecommunications functions of the former KP&TC. Telkom is a public company registered under the Companies Act, and is presently wholly owned by the Kenyan Government. The Government of Kenya (GOK) is offering 49% of its equity shares to a strategic investor and other shares to investors through the Nairobi Stock Exchange. The government reaffirmed its intention to sell the stake in Telkom in a policy statement this past December (CCK Press Release, 03/12/2001).

Telkom holds licenses for and operates the following services: Local Telephone Services, National Long Distance Telephone Service, International Gateway Service, Global Mobile Personal Communication by Satellite, Mobile Radio Services, VSAT Services, Internet Node and Backbone Services, Value Added Services, Customer Premises Equipment vending, and Internal and External wiring services. With regards to local telephone service in the capital city of Nairobi, national long distance and international telephone service, and the country's Internet backbone Telkom has a monopoly through June 30th 2004.

Infrastructure Roll-Out

Under the former KP&TC, and now Telkom, Kenya's landline exchange capacity has grown at an average rate of 7.25% per year from 112,681 lines in 1981 to about 490,000 lines as of the middle of 2002 (CCK Website). The CCK estimates that only 328,116 of these lines were actually connected to end users as of July 2002. *Balancing Act*[7] estimates that only approximately 120,000 of these connected users are located in Kenya's rural areas, home to approximately 80% of its population.

[6] Telkom's monopoly on JamboNet, the country's international Internet backbone, is set to expire in 2004. The incumbent is currently lobbying to have its exclusivity period extended.

[7] Balancing Act is a weekly news update that covers connectivity developments in Africa.

Main Telephones in Operation, 1993 - 2001									
Year	1993	1994	1995	1996	1997	1998	1999	2000	July 2002
Lines	214,759	228,522	256,434	266,780	271,816	288,251	296,400	310,000	328,116

Source: CCK.

The number of public telephone booths in operation in Kenya has increased at a faster rate, rising from 588 in 1981 to about 10,000 as of mid-2001 (Ibid.). These pay phones will be supplemented further by the installation of payphones in upcountry locations by the mobile and regional telephone operators as part of their licensing conditions[8]. However, this initiative has stalled in the face of interconnection disputes between the mobile operators and Telkom, and the number of payphones estimated to be in operation by the CCK did not change between July 2001 and July 2002. During the past twenty years the country has also experienced a modernization of its network, with the CCK estimating that the national level of network automation increasing from 84.3% (15.3% in rural areas) in 1981 to the current 98% (40% in rural areas).

Between the financial year of 2001/2002 and 2001/2002 the cost of a three minute local call (a call within 60 kilometers) on Telkom's network rose from Kshs 4.71/minute to 5.61/minute[9]. During the same period the cost of a long distance call fell from between 21 – 27 Kshs/minute to 20 – 25 Kshs/minute depending on whether the distance of the call was greater than 230 kilometers or not. Given that the majority of calls in most countries are within the caller's local service area, for most users the cost of the 19% increase in local phone tariffs will outweigh the approximate 5% reduction in long distance rates. Furthermore as most Internet users pay local call charges to connect to the Internet, the new rate regime will not help to bridge the digital divide in the country.

With a population of 29.01 MM as of the 1999 census, Kenya has a teledensity of about 1 fixed line per 100 people as of July 2002. The last breakdown of urban and rural teledensities for which data is available was 2000 when it was estimated that there were 0.16 fixed lines / 100 people in rural areas and 4 lines / 100 people in urban areas. At the same time the percentage of households/offices with a telephone was estimated at 4.2% nationally, with a range from 0.1% in remote districts to 27.7% in Nairobi. The GOK's objective is to improve telephone penetration to 5 lines per 100 people by the year 2015. In rural areas the aim is to reach 1-line/per 100 people by this date, while the penetration goal for urban areas is 20 lines/per 100 people. These targets translate into the installation of over 375,000 lines in rural areas and 2MM lines in urban areas. At a cost of between $US 800-1,250 per line, the total investment needed to meet this target is estimated to fall between $US 2-3B (CCK). The GOK hopes that initiatives to liberalize the telecommunications industry will be able to attract a large amount of this needed capital from the private sector.

As a first step towards this goal, in return for its monopoly exclusivity Telkom has a roll-out obligation of 225,000 lines between 1999 and 2004 (Kenya Information Society, 2000). From the table above it is painfully apparent that as Telkom only connected approximately 30,000 users in the first three years of this period this target will not be met. This is another example of where an independent regulator with teeth would be of benefit to the rural poor in the country who are currently served by 1.6 lines per 1,000 people. In response to Telkom's clear inability to hit its roll-out obligation the monopoly operator has been fined 58MM Kshs. However, this fine only represents 0.2% of the Kshs 25 Billion that the Harare based Financial Gazette estimates the operator's annual revenues to be. It should be noted that in South Africa operators are required to contribute slightly more than this percentage of their revenues to that country's Universal Service Fund on an annual basis. A fine of 58MM Kshs (less than $1MM) is far less than the amount that it would cost Telkom Kenya to roll-out the 200,000 additional lines called for by its license. If the CCK's low range figure of a cost of $US 800

[8] For example, KenCell has to have 2000 GSM payphones installed by 2004.
[9] As of the beginning of 2002 the exchange rate was about 77 Kshs to 1 US Dollar.

per new line from above is used the total cost of these 200,000 additional lines is in the neighborhood of $160MM – not an unreasonable figure as the mobile operator KenCell has invested $220MM in its network to connect 465,000 subscribers over the past three years. Weighing the cost of the 58MM Kshs fine against the investment it would require to meet its exclusivity target it is easy to see why Telkom Kenya would not even make a genuine attempt to reach this goal. If the regulator wants national roll-out of fixed line infrastructure it should consider the licensing of other national operators to provide competition to Telkom in this area.

Service Quality

According to the most recently gathered data, anecdotal information, and personal experience there are significant problems with the quality of Telkom's service. Tyler, *et al* (1994) note that the national rate for call completion in 1993 hovered around 50%. This problem was largely due to network congestion; voice traffic in the network was growing at an annual rate of 21%, significantly faster than the 7.5% rate of growth in new lines. The combination of network congestion, the estimated waiting list of 120,000 people for new lines (translating into a wait of roughly 6.2 years)[10], and the explosive growth in cell phone subscribers during the past three years (described below) indicate that there is significant unmet demand for telecommunications services in Kenya.

Apart from the wider social costs of this unmet demand one could expect to find a significant level of direct and indirect revenue losses by small and micro businesses in upcountry Kenya as a result of their inability to get lines installed, connect calls to Nairobi or regional centres, utilize text based e-mail and fax technology in business operations, and other telecommunications barriers. On the operations side, in terms of efficiency, the reduction of unnecessary journeys alone that the presence of telecommunications lines imply can have a major impact on the productivity of rural organizations (Grace *et al*, 2001). For example, an ITU study[11] cited by these authors of factories in rural Bangladesh found that the introduction of a telephone line reduced the amount of management travel, thus cutting associated travel costs (gasoline, salaries, etc) by a factor 13 times the cost of installing the line.

Unfortunately, Telkom is unlikely to make any efforts to deal with its range of roll-out and service problems until after the December 2002 national elections and until then will only do the minimum required to maintain its exclusivity privileges. As the case of its fixed line roll-out targets demonstrates, it is apparent that this minimum will not even involve attempting to meet the conditions required by its license. Furthermore, despite the government's statement of its intention to sell a stake in the company to the private sector, most industry observers have difficulty seeing how this will occur in the near future. Until (if) this happens, Telkom most likely will refrain from making infrastructure investments and the government will milk the operator for its cash flow.

Privatization Process

The fallout from the initial effort to sell the 49% stake in Telkom to the so-called Mt. Kenya Consortium (Dutch operator KPN, Econet Wireless of Zimbabwe, and South African parastatals Eskom Enterprises and Transtel) will serve as a deterrent to any future party considering purchasing a stake in the monopoly. The Consortium beat out rival bidders Malaysia Telecoms and Egyptian operator Orsacom. After agreeing on a sale price of US $310MM ($225MM payment and $85MM in guaranteed loans) and drafting a press release, the GOK pulled out of the deal in February 2001 (Kisero, 2001). The decision to pull out was reportedly made at the cabinet level and was in opposition to the advice of the GOK industry specialists who had negotiated the deal. Observers speculated that this action occurred as the government A) thought that the Mt. Kenya Consortium's price was too low and it could get a higher offer from one of the other bidders and B) certain government officials would not welcome the increased transparency of the equipment procurement process of a privatized Telkom. It should be noted that this about face was in direct violation of the GOK's own

[10] Kenya Information Society (2000). **Note:** This was the most recent estimate available, with the growth of cell phone subscribers during the intervening two years the size of this list has probably decreased.

[11] ITU (International Telecommunications Union). 1998b. WTDC Backgrounder. World Telecommunication Development Conference (WTDC-98), Valletta, Malta, 23 March – 1 April. (http://www.itu.int/newsroom/press/WTDC98/ backgrounder.html)

license tendering process. Ultimately, the government was unable to get a better price from the Malaysian or Egyptian bidders. Given the ensuing meltdown of international telecom sector and the GOK's violation of its own tendering process, it is unlikely that the government will be able attract an offer that matches the South African bid in the near term.

Unfortunately, the tortured privatisation experience of the Telkom Kenya case is not an atypical result of government involvement in the affairs of the Kenya's parastatals. Anecdotal information would indicate that when certain sectors within the economy have been "privatized" by the government it is perceived that they have often been privatized "to itself" - that is to groups that have reputed links to government officials. When investor groups lack these links the privatisation process often does not seem to be concluded. Ordinary Kenyans have therefore developed a strong perception that when the government becomes involved in drafting sector policy or selling stakes in public companies to private investors there are often hidden agendas involved that can trump national interests. This problem of perception extends to the operations and sale of the stake in Telkom as well as to concerns about the ownership groups of the mobile phone operators.

The failed Telkom privatization is a missed opportunity that may be lost permanently as it is unlikely that the government will be able to get a future investor to pay a price matching that of the Mt. Kenya Consortium. It is clear that the partial privatisation of Telkom Kenya would not have solved the problems of the fixed line sector by itself, for as Gillwald (2002) argues privatisation without effective liberalisation often results in the inefficient extraction of monopoly profits by the newly privatised incumbent. However, Telkom's privatization would have been a start towards increasing access to telecommunications services on a more widespread basis nationally by stimulating infrastructure investment. It was also an opportunity for the government to send a symbolic message to the sector of a shift in focus from protecting the state monopoly to that of promoting the public interest. The moribund state of the fixed line infrastructure in Kenya and the lack of investment is only too apparent when compared with the country's fast growing mobile telecommunications sector. Unfortunately it is Kenya's rural areas that will continue to bear the primary brunt of this failure.

Mobile Cellular Operators

The mobile cellular market in Kenya has recently been opened up to competition and is currently a duopoly. The two service providers are SafariCom Company Ltd (60% owned by Telkom Kenya, 40% by Vodafone UK) and KenCell Communications Ltd (60% owned by the local Sameer Investments Group, 40% by Vivendi International).

KenCell was licensed as the second mobile operator on 28th January 1999 and began offering service in August 2000, at which time SafariCom had 20,000 subscribers. Since that time, the benefits of competition have been clear and the mobile telephony market in Kenya has seen explosive growth and should pass the one million subscriber mark before the end of this year. According to the CCK the industry had 965,000 subscribers as of July 2002. Thus, in less than three years the cellular phone industry has connected approximately three times as many subscribers as Telkom/ KP&TC have in the last 30.

Growth in Cellular Phone Subscribers, 1997 - 2001

Year	1997	1998	1999	2000	June 2001	December 2001	July 2002
SafariCom Ltd	3,000	6,000	15,000	54,000	160,000	~300,000	500,00
KenCell Com. Ltd	-	-	-	60,000	190,000	~300,000	465,00
Total Subscribers	3,000	6,000	15,000	114,000	350,000	~600,000	965,000

Source: CCK, Personal Communications with the author.

The explosive growth in cellular phone subscribers is an indication of the demand that was not being met by Telkom and of the high level of dissatisfaction with the incumbent's service quality. It is also a result of progressive action by the government to lower taxes on terminals, the regulator suspending type approval of terminals, and the operators reducing the cost of handsets to consumers (Mureithi, #76).

This combination of competition, private capital, and progressive government action has allowed for a steep reduction in the tariffs charged to users and thus has been effective in combating the strong income effect typically seen in access to telecommunications services. In 1999, prior to KenCell's entry into the market, SafariCom customers faced a Kshs 10,000 activation fee and a tariff of 28Kshs/minute to call other users on SafariCom's network. In January 2002 the SafariCom activation fee was Kshs 2,000 (and likely to fall as KenCell's activation fee was 900Kshs) and a per minute tariff of 10 Kshs. The steep fall in cost of mobile to the user, combined with the rapid roll-out of network coverage by the two operators, has made telephony service a realistic option for many rural dwellers for the first time. The mobile telephony sector is therefore an example of a case where a progressive policy framework can be successful in stimulating access to telecommunications services by the general population in developing countries.

Unfortunately, despite this significant progress, a large part of this boom is bypassing the rural areas as the service, and especially the start-up cost of acquiring a phone and paying an activation fee, are beyond the means of the most rural Kenyans. Officials at both of the mobile phone operators estimate that between 70-80% of their respective customers are located in the main cities of Nairobi and Mombasa[12].

Indeed, not all is perfect within the world of the mobile phone operators. The two operators are finding it increasingly difficult (and more expensive) to keep adding subscribers as the upper end of the market becomes saturated. Fatuma Mohamed, head of PR at KenCell, believes that given current income levels and education the Kenyan market can currently only support about 1MM subscribers. The operators are also facing complaints from the CCK over the quality of their service and their pricing policies. The quality issue is largely due to the ramifications of the unforeseen rate of subscriber acquisition that has resulted in the volume of traffic on the operators' GSM networks being much greater than they themselves had forecast. While the CCK cannot directly regulate mobile call pricing or force a quality improvement from the providers, it can and is said to favor the licensing of a third operator to address its complaints through increased competition within the sector. The body does not believe a third operator would harm the viability of the current incumbent providers, as it believes that 300,000 subscribers are enough to support an operator.

The CCK has acted in a progressive fashion in the sector by allowing competition in the sector, reducing the bureaucracy around the approval of handsets and terminals and most recently by recently allowing the two mobile providers to interconnect calls between themselves directly without using Telkom infrastructure. The regulator hopes this action will affect a reduction in the high rates that SafariCom subscribers pay to call KenCell subscribers (between Kshs 24/min post-paid and 50/minute pre-paid) and vice-versa (Kshs 25/min and 40/minute). The CCK's forthcoming approval of the agreement between the operators is important as it will allow subscribers of what are now the two largest operators in the country to interconnect with each other at a lower rates by bypassing Telkom's infrastructure and thus its interconnection fees. The CCK has also recently stepped in to settle a dispute between KenCell and Telkom to lower the interconnection fee charged by Telkom to KenCell for terminating calls on its network from Kshs 23.50/min to an interim rate of 21.70 per minute. The fact that this was done with CCK Director General Samual Chepkong'a stating his express hope that "KenCell with pass the benefits of the lower interconnect tariff to subscribers" is an indication of the growing importance that the CCK is placing on increasing the affordability of telecommunications services to its population.

[12] Personal communication with the author.

SafariCom

SafariCom was Kenya's first licensed GSM network operator and began offering service in 1997. The network currently has approximately 500,000 subscribers, although its subscriber growth did not take off until the year 2000 after the combination of government action and the Vodafone investment provided cash for network expansion. The operator offers three prepaid and one postpaid service option. The prepaid options contain a combination of peak and off peak rates[13] that range from Kshs 10 to Kshs 30 per minute for calls to other SafariCom customers. The Postpaid option charges Kshs 12.60 per minute for calls at all time to SafariCom customers and also has Kshs 550 monthly fee. Activation fees are currently between Kshs 2000-2,500 depending on the service option chosen.

According to Vincent Muriithi, Head of Sales at SafariCom, Safaricom offered service in the following 33 towns as of January 2002: Athi River, Bamburi, Busia, Eldoret, Embu, Gazi, Gilgil, Isiolo, Kabarnet, Kajiado, Kakamega, Kericho, Kilifi, Kisii, Kisumu, Kitale, Kitui, Makindu, Malindi, Meru, Mombasa, Muranga, Nairobi, Naivasha, Nakuru, Nanyuki, Narok, Nyeri, Nyahururu, Olioitoktok, Thika, Vanga, and Voi. During 2002 SafariCom plans to focus on improving the quality of coverage in the areas in which it is already present and on completing its coverage of the country's major highways.

KenCell

As stated above, KenCell was licensed as the country's second GSM network operator in January 2000 and in two and a half years of operation has signed up 465,000 customers. KenCell launched its Yes! postpaid service in August 2000 and added a Yes! card prepaid service in three months later. As further evidence of the effect of competition in the sector on user costs, the activation fee for a Yes! account was lowered by two thirds from Kshs 2,500 to Kshs 900 during the 4th Quarter of 2001. Calls made with the postpaid service to other KenCell users are charged at 10 Kshs/minute, while the charge for the same call with the prepaid service is 15 Kshs/minute. Incoming calls are free.

As of January 2002 KenCell offered service in the following 39 towns: Athi River, Bungoma, Busia, Diani, Eldoret, Embu, Gilgil, Kakamega, Karatina, Kericho, Kerugoya, Kiambu, Kikuyu, Kilifi, Kiserian, Kisii, Kisumu, Kitale, Limuru, Machakos, Makuyu, Malindi, Meru, Mombasa, Mumias, Muranga, Nairobi, Naivasha, Nakuru, Nanyuki, Naro Moru, Ngong, Nyeri, Ongata Rongai, Ruiru, Sagana, Sokoke, Thika, Webuye.

By July 2002 it plans to have expanded its coverage to include: Narok, Kajiado, Garissa, Voi, Kwale, Migori, Awendo, Keroka, Sotik, Nyamira, Homa Bay, Nandi Hills, Kangundo, Matuu, Kitui, Kendu Bay, Masai Mara, Moi University, Kisumu Hydropower, Othaya, Kangema, Gatundu, Bondo, Siaya, Nyahururu, Lokichoggio, Molo, Njoro, Rongai, Mariakani, Kaloleni, Mazeras, Malaba, Maseno, Kaimosi, Kapsabet, Isiolo and most major roads and highways such as Mombasa-Diani, Kericho-Kisumu, Isiolo-Meru, Eldoret-Webuye and Nakuru-Eldoret.

Mobile Internet

On January 22nd 2002, KenCell announced the launch of Access350, a mobile Internet service that it is offering in conjunction with local ISP SwiftGlobal[14]. In the future it plans to expand the service to include two additional local ISPs. SafariCom does not have a mobile Internet service currently, although Mr. Muriithi at SafariCom was said that such an offering it being considered.

With the introduction of the Access 350 service any KenCell customer with a Wireless Application Protocol (WAP) enabled phone or PC/Laptop connected (via a cable or infra-red) to a KenCell phone with a built-in digital modem will be able to access the Internet from wherever KenCell has coverage by dialing 350.

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[13] Peak hours are 8AM-8PM Monday-Friday (SafariCom).

[14] Mr. Francis Wangusi, Head/Telecommunication Development, at the CCK indicated to the author that the Commission does not anticipate any regulatory issues with the service as each of the operators is appropriately licensed for its respective component of the service. However, he did not rule out the possibility of the CCK examining the interconnection between the two operators' networks at some point in the future.

The Access350 service will not require a user name, password, or ISP account and users will be charged at the rate of Kshs 10/minute during peak hours and Kshs 5/minute during off peak hours[15]. Depending on the time of day this is either equal to or cheaper than the lowest priced call on KenCell's network. While this per minute price is certainly not cheap for most Kenyans, it will be competitive with dial-up alternatives that cost Kshs 1,000-3,000 per month for an ISP account as well as the approximate 2 Kshs/minute charge for a local call. It will be particularly competitive in rural areas where instead of the 2Kshs/minute charge most users would have to pay a Kshs 20/minute long distance tariff to connect to the Internet. KenCell is pricing Motorola phones with the built in modems necessary to access the service at about Kshs 7,000 with a Kshs 1,000 set-up fee if you need help in configuring your computer for the service.

KenCell and SwiftGlobal officials are targeting the Access350 service at two main groups. The first are mobile professionals with high connectivity needs. The second group is Kenya's rural population. The service aims to overcome the severe infrastructure limitations in rural areas and the high expense of having to make a long distance call to connect to the Internet necessitated by the lack of POPs in most Kenyan towns. While the maximum speed of Access350 will probably only be about 14.4 Kbps and therefore slower than dial-up in Nairobi, this is still faster than the effective speed provided by Telkom's mostly analog lines in rural areas. Service quality wise, Richard Bell (MD of Swift Global), claims that Access350 will be the most reliable Internet service in the country (no dropped connections) as it will be the only method of access that is completely digital from end-to-end.

The Access350 service was launched in February 2002 and according to Mr. Bell has seen significant uptake, although there has been some confusion as many users have seen the service purely as a WAP application rather than as an alternative means to connect to the Internet using a computer. While the data transmission speed of the service has largely been too slow for urban users, as expected the service has proved to have considerable appeal in rural areas. According to Mr. Bell it has been very popular with small entrepreneurs in rural areas, so much so that Swift Global is working with a microfinance bank to develop the service into a microfinance product for rural communities[16]. With KenCell on track to meeting it goal of covering 56% of the Kenyan population by the end of 2002 the Access350 service has the potential to make Internet and email services available to large parts of the Kenyan population that did not previously have this opportunity.

Implications

The introduction of voice telephony to a growing number of Kenya's rural areas for the first time via mobile technology is likely to expand the opportunities available to entrepreneurs, farmers, schools, and hospitals in these areas. For example an Asian Development Bank study cited by Kenny *et al*, (2001) found that the introduction of telephones in rural Thailand allowed farmers to regularly check prices in Bangkok, which significantly increased profits. "One village chief . . . reported that farmers' income in his village where a telephone was installed...doubled."[17] In addition to the benefits of voice telephony, the Access350 service will help to make data based services available to rural locations as well. This may allow for more extensive price and market information systems to be made available, reduced communication costs via the use of e-mail, new business opportunities along the lines of the GrameenPhone Project, etc. Indeed Mr. Bell's comments indicate that this process is already beginning to happen with Access350 and microlending. In this context the presence of mobile technology by itself has the potential to improve the general environment of economic activity in these areas. Poverty alleviation institutions should perhaps be considering how their funds and project interventions could be used to unlock this potential.

While the prices of mobile services are still expensive to most Kenyans as compared to the tariffs rates of fixed line calls, the recent interconnection agreements and the planned licensing of a third operator should help to ensure that prices for these services continue to

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[15] Peak hours are 8AM-6PM Monday – Friday and 8AM-1PM on Saturdays (KenCell).
[16] Personal communication with the author.
[17] ITU (International Telecommunications Union). 1998. Rural Telecommunications in Colombia – Lessons Learned. World Telecommunication Development Conference (WTDC-98), Valletta, Malta, 23 March – 1 April.

fall over time. While mobile is beginning to address the needs of rural users, the other element of the equation is of course to try to improve the situation in the fixed line infrastructure in rural areas. The Kenyan government's phasing in of competition to Telkom in this sector through the establishment of Regional Telecommunications Operators is the primary mechanism by which it is envisaged that this will be accomplished.

Regional Telecommunications Operators[18]

As the Kenyan government made the first step towards liberalization of the telecommunications industry during the late 1990s, one of the main arguments made by opponents of liberalization was that a state monopoly was necessary to ensure that Kenya's rural regions were not left behind. Therefore, all operators within the newly liberalized sector were required to contribute towards a universal access program and the government announced its intention to establish operators to set up and operate networks in the rural areas outside of Nairobi (Mureithi, #76).

Tenders for eight licenses to provide service in the provinces outside of Nairobi were launched in February 2000 with each license covering a specified region where the only other fixed line competitor was Telkom Kenya. The winners and the regions that they were to cover are as follows:

- Telair Telecommunications Ltd (Central, Coast, Nyanza, South Rift, and Western Provinces)
- Safitel Ltd (Eastern and North Rift Provinces)
- Bell-Western Ltd (North Eastern Province)

The licenses were granted for 15 years, renewable for a further ten years upon their expiration, and are for the provision of local exchange basic voice services, inter-exchange basic voice services, and regional long-distance basic voice carrier services.

The three winning bidders committed to invest up to US $350MM to provide 299,000 lines or build a fixed line/wireless network matching the size of Telkom's outside of Nairobi within three years (Mureithi, #76). This investment in new networks in rural Kenya is desperately needed, as with the exclusion of the country's cities, 80% of Kenya's population (some 23MM people) is currently being served by only 120,000 landlines. In addition to the infrastructure investment, the winning bidders agreed to pay the government an upfront license fee of US $37MM. However, in the ensuing two years none of the RTOs have actually paid its license fee or begun to build out its network.

There are both exogenous and endogenous reasons as to why the RTOs have not taken up their licenses. On the external front, the international telecom meltdown, mostly recently manifested in the collapse of WorldCom and Global Crossing, has made the prospect of investing millions of dollars in infrastructure and license fees much less attractive to the winning bidders. On the internal front, the telecommunications market conditions in Kenya have changed drastically. At the time of the license tendering process the only competition for potential operators in rural areas came from the outdated Telkom network. At that time SafariCom was Kenya's only mobile phone operator and they only served 20,000 customers in and around Nairobi. Under these circumstances the market for the RTOs looked promising. However, when the time came for the winning bidders to take up their licenses the boom in the mobile market had completely changed the market dynamics (Mureithi, #76).

In addition to these factors, upon further reflection, the RTOs had several complaints on the terms of their licenses. The licenses did not allow operators to interconnect calls among regions, terminate calls to Nairobi, or place international calls. All of these services had to be offered through an interconnection with Telkom's infrastructure. Therefore, with the prospect of a $37 MM license fee, stiff competition from the mobile providers, no clear path towards

[18] This section follows closely the excellent analysis of Kenya's Rural Telecommunications Policy presented by Muriuki Murethi in Balancing Act New Update #76.

being able to offer national and international services, and the declining state of Kenya's rural economy, the RTOs developed a severe case of cold feet (Mureithi, #76).

Richard Bell, MD of Local ISP SwiftGlobal and Chairman of TESPOK, believes that it is possible that the RTOs will take up their licenses sometime in 2002. He believes that the GOK may make concessions by reducing/staggering the payment of license fees, giving the operators permission to interconnect calls between regions, and perhaps providing a path towards terminating calls to the capital and international locations following the expiration of Telkom's exclusivity in 2004. As another means of overcoming the RTOs' concerns over the remote, low income, and uncertain return offered by the provision of local telephone service in rural areas, ATU Secretary General Jan Mutai has proposed allowing the RTOs to bundle wireless and Internet access services with local phone service to improve their prospective returns and profit margins[19]. If these changes do indeed occur it will be an important step towards the transformation of the outlook of the government towards the privatization process, regarding it as a long-term effort to upgrade the country's infrastructure rather than as a short-term mechanism to collect license fees (Mureithi, #76).

The Head of Telecommunications Development at the CCK stated in January 2002 that the Commission and the RTOs had agreed upon a schedule for the staggering of the license fees earlier that month[20]. The substance of the agreement was that the RTOs holding licenses for multiple regions will be able to interconnect calls between the regions that they hold licenses for, but will not be able to connect calls outside of their licensed area as this would create a series of national operators. CCK officials were therefore optimistic that the RTOs would take up their licenses soon. Unfortunately this has not occurred. According to Muriuki Mureithi of the Kenya Information Society the essence of the problems outlined in the analysis of the rural telecommunications policy presented above remains unchanged and it does not appear that the licenses will become active in the near future[21]. This situation raises the danger that there will be no investment or competition in fixed line areas until the potential licensing of a second national operator following the exclusion of Telkom Kenya's exclusivity in 2004.

This potential outcome is obviously a matter of concern. The review of Telkom Kenya's infrastructure presented earlier in this paper has demonstrated the low teledensity and moribund service levels present in fixed line infrastructure in the country's rural areas. Access to advanced communication services in these areas is almost zero. While mobile telephony is starting to address this gap, the fact remains that basic voice telephony services, under Kenya's current tariff regime, are still significantly less expensive to the end user when delivered via fixed line. This cost consideration is especially important given the low income levels in Kenya's rural districts. Furthermore, Telkom's failure to meet its roll-out targets indicates that additional investment will not be forthcoming from the monopoly operator. As this paper noted above, the exclusion of rural areas from the benefits of modern telecommunications services could trap many areas in poverty. The regulator and/or Ministry of Transportation and Communication clearly need to act to ensure that some form of investment in fixed infrastructure in rural areas does occur. Some combination of the RTOs, a potential second national operator, or the partial privatization of Telkom to unlock investment in the fixed line sector should be considered a priority.

Internet Service Providers (ISPs)

One of the first telecommunications sectors in Kenya to be liberalized was that of Value Added Services, which includes the provisioning of Internet access to residential and corporate accounts. At the time of this liberalization in 1996 there were 9 licensed ISPs in Kenya. According to the CCK, there are currently 67 registered ISPs, although interview respondents have put that figure as high as 90 as of January 2002. However, only approximately 30 of these entities are operational, and of these only 10-15 are serious

[19] There is a regional precedent for this type of an operator, as Zantel is licensed by the Tanzanian Communications Commission to provide a full set of communications services for the island of Zanzibar. However, it is unlikely that the RTOs would be allowed to bundle services without a fight as both Telkom and the mobile phone operators would probably take the CCK to court arguing that allowing the RTOs to offer multiple services would violate the exclusivity conditions of their respective license agreements.

[20] Personal communication with the author.

[21] Personal communication with the author.

players. Most of the remaining operational ISPs are actually corporations that purchased an ISP license to offer access services to themselves and to thereby avoid the expense of contracting a provider.

In its most recent figures the CCK estimates that Kenya has a total of about 40,000 dial-up Internet subscribers and close to 100,000 people whom regularly access the Internet and e-mail services. More recently Nua Internet Surveys has put this figure at 200,000. Getting an accurate read on the exact number of ISP accounts in Kenya is difficult as individual ISPs do not always provide subscriber figures and there is a high degree of customer churn. Estimating the total number of people using the Internet in the country is even more difficult as it involves estimating the number of people sharing individual ISP accounts and as well as those accessing the Internet through shared facilities such as cyber cafes, offices, and university networks. According to the best estimates available, the main players in the industry are market leader Africa Online, ISP Kenya (2,500 subscribers), Wananchi Online (5,800), NairobiNet (1000), SwiftGlobal (2000-3000), and KenyaWeb. These organizations account for about 60% of the dial-up market (Southwood, #88).

Approximately 90% of the country's dial-up subscribers are located in Nairobi and in nearly all of the rural areas a long distance call over analog lines is required to connect to the Internet. Currently, according to data gathered in industry interviews, there are Internet POPs in Nairobi, Mombasa, Nakuru, Kisumu, Malindi, Diani, Kisii, Kericho, Nanyuki, Nyeri, and Eldoret[22]. Francis Wangusi, Head of Telecommunications Development at the CCK, also points out that Telkom has set-up POPs in a number of Kenyan towns but these are not being utilized by the ISPs because of infrastructure reliability and service pricing issues. The CCK has recently licensed the Kenya Postal Corporation as an ISP, and given this organization's historical ties with Telkom Mr. Wangusi hopes that it will start exploiting this resource in the near future.

Monthly prices for access range from Kshs 850 to Kshs 8000 with an average price of Kshs 3000 (Southwood, #88). Most industry observers believe that the cheap end of the market is unsustainable based on current connectivity charges and that an industry rationalization will occur within the next 12 months. Winnie Wambuga, Marketing Manager of 30-month old Wananchi Online (which charges Kshs 1,000 per month for unlimited access) disagrees arguing that Wananchi's administrative cost savings through the use of pre-paid annual billing and better quality of its equipment allows it to charge lower prices than its competitors.

Despite Wananchi's claims, the ISP sector in Kenya is currently in a difficult state with problems on both the supply and demand sides. On the supply side problems stem from the expensive and dilapidated infrastructure provided by Telkom, while on the demand side there are a limited number of Kenyans who can afford, have the knowledge to utilize, and are interested in paying for a monthly subscription to the Internet.

Southwood (#88) views Telkom's exhausted copper infrastructure and monopolization of international traffic as representing key supply side restrictions on the dial-up market, without which it would have the potential to be as large as 60,000-100,000 subscribers. The ISPs are completely dependent upon this exhausted infrastructure to offer service and are increasingly dissatisfied with the status quo. Potential customers are unable to get the phone lines necessary to subscribe to their service. It usually takes Telkom two-four months to set up a leased line for Internet access after personal considerations have been taken care of, and customers are constantly being disconnected in the middle of Internet sessions. This problem has been compounded by the equally unreliable state of the electricity infrastructure in the country. It was estimated in 1997 that only 8% of Kenyan homes have commercial power, and that the majority of these are in urban areas (Kenya Information Society, 2000). On the technology side, despite strong customer demand, ISPs are prevented from making use of VSAT technology or offering VoIP capability to their customers, as these services are said to violate Telkom's monopoly. In response to these complaints the industry body, TESPOK, is growing increasingly active and has won recent successes, including the licensing of the

[22] **Note:** These towns are the locations where it was possible to confirm to confirm with an ISP that there is a POP present. There are probably other towns with POPs, but unfortunately there is no comprehensive source for this information. The CCK itself has not been able to compile a complete list.

KIXP as discussed above. It appears that the next big issue that TESPOK may attempt to tackle is the liberalization of the VSAT market (discussed in the satellite section below).

On the demand side, a recent survey of Internet users published in the East African Standard found that the typical Internet user in Kenya is aged between 18-44 years, has completed an undergraduate college degree, and has a stable job that earns over Kshs 25,000 per month (Balancing Act News Update #86). Unfortunately this rules out a large part of the population in the major Kenyan cities and almost all of the population in its rural areas. To put this problem in context, it has been estimated that the average monthly income of rural Kenyans is about Kshs 1,300 (Benjamin, 2001), or approximately the monthly fee charged by the low end ISPs in urban areas. This low demand, combined with the extremely poor state of the fixed line telecommunications and electricity infrastructure outside of the cities, has led to the ISPs all but ignoring the rural areas. The lack of a business case for ISPs to operate in rural areas (which is exacerbated by the policy regime), combined with the failure thus far of the RTO initiative, has led to Kenya's rural areas being completely bypassed from a telecommunications standpoint.

On the rare occasions that ISPs have attempted to offer services in rural Kenya, the state of Telkom's infrastructure has often prevented them from doing so. One Kenya ISP told *Balancing Act* that it ordered over 100 lines over 9 months ago and it is still waiting for 27 of them to arrive. It wanted new digital lines to connect Nakuru and Nyeri (both rural towns) but Kenya Telkom was unable to provide them as it needed the capacity for its new calling card service. The complaint filed with the CCK on this matter only elicited a response that was sympathetic to Telkom Kenya[23].

Therefore it is difficult to blame the ISPs for this situation, as they are struggling to survive on the low margins present in the urban residential dial-up market, and as a result are focusing on the large corporate market in order to survive. Even Wananchi (Kiswahili for "the citizen"), the ISP pioneer of low priced dial-up access, has signed up over 60 large corporations as clients.

The root problem of the ISP industry is that it cannot control the key component of their service, namely the reliability and speed of the access to the Internet that it provides to its customers. Since all of the ISPs must resell Telkom lines and rely upon JamboNet for international access, it is difficult to compete over providing better and more reliable access. The problem is so severe, that given the frequency of service interruptions, wealthier individuals often have two ISPs at both the home and at the office in order to provide connectivity redundancy. Given that they must all deal with the same spotty infrastructure, ISPs struggle to differentiate themselves and customers are left to choose among the various providers based largely on price. (Southwood, #88)

Compounding this problem is the lack of a competitive threat to force Telkom into offering the ISPs prices more in line with its own costs. Kamande Muiruri, Chief Executive Officer of Africa Online, says that the Government's failure to license another backbone service provider to compete against the inefficient Telkom Kenya's Jambonet Internet backbone, will continue to impair the development of the Information Communication Technology (ICT) sector. The ISPs had hoped that Finance Minister Chris Obure would introduce a Parliamentary Bill that would amend the exclusivity license enjoyed by Telkom Kenya in order to boost the ICT sector, but it did not happen in the last budget. "The inefficiency of JamboNet as a backbone service provider", says Mugo Githongo, Chief Operating Officer of Media Africa and a member of the Kenya Information Society (KIS), "warrants liberalisation of the sub-sector before 2004. Jambonet's bandwidth capacity is inadequate to service the needs of all the telecommunications providers effectively." Githongo also highlights the expensive, unreliable and poor nature of the service provided by JamboNet. (Okello, 2002)

The CCK's response to these concerns is indicative of a worrying trend in the sector. According to CCK Director General Samuel Chepkong'a "The Government must be consistent in liberalization of the sector. The agreement when the Kenya Posts and

[23] Balancing Act News Update, #120.

Telecommunications Corporation (KPTC) was split, gave Telkom a five-year monopoly period in preparation for full liberalization. It is Government policy in view of the sensitivity of the telecommunications market structure to retain a monopolistic tendency for the state corporation before the market is fully liberalized." (Okello, 2002) In light of Telkom's complete failure to meet its fixed line roll-out targets and retarding effect of JamboNet on the development of the Internet sector in the country it is time to reexamine the market structure in the sector. The importance of telecommunications and the Internet to overall national competitiveness should outweigh the desire to stick to a market structure that is failing to meets its objective of adequate coverage of rural and other high cost areas.

In fact events have moved in the opposite direction. In early 2002 the biggest fear of the ISP industry was that Telkom would take the difficult situation one step further and undercut the ISPs by offering end user Internet access itself, thereby completely bypassing the industry. Given all of the problems currently being encountered with Telkom one would expect that this would not be allowed by the regulator. However, in April 2002 Jambo Telkom, a fully owned subsidiary of Telkom Kenya, was licensed as an ISP. The CCK has implemented "strict conditions to safeguard against cross-subsidization by its mother company"[24], but the ISP industry is understandably concerned about the prospect of unfair competition that Jambo Telkom raises. Even if the feared cross-subsidization is prevented there are clearly other means Jambo Telkom could benefit from its link to Telkom Kenya. For example, Jambo Telkom may get quick installation of the digital lines necessary for it to offer service while other ISPs continue wait months for the same installation. With its record of abysmal performance in other sectors, uncompetitive behaviour, and fierce fight against the establishment of an IXP in the country it seems strange that the monopoly would be rewarded with an ISP license.

The policy structure, particularly lack of competition in the provision of Internet backbone services and the prospect for price undercutting raised by the licensing of Jambo Telkom, have worrying implications for rural areas. ISPs are already struggling to survive in the face of fierce price competition and have largely bypassed rural areas because of the low income levels in these regions. Allowing competition in the provision of Internet backbone services and satellite provision of Internet access in rural areas (discussed in more detail below) could help to lower the cost structure of ISPs and thus make providing service in some rural areas more economical. Instead, despite a record of poor performance, Telkom has been allowed to offer ISP services. This raises the prospect of Telkom offering preferential rates and services to its subsidiary, further weakening the private sector ISPs. If these ISPs were to be driven out of business by this new market structure, the responsibility for the roll-out of Internet access services in rural areas would be left to the monopoly operator that did not even make a genuine attempt to meet its most recent fixed line infrastructure roll-out targets.

Cyber Cafes

Kenya's cyber cafe industry is also currently in a state of flux, as the approximately 300 cyber cafes in the country (most of which are located in Nairobi), are currently in the throws of fierce price competition. Kiragu Maina of Africa Online believes that "There is a price war going on and margins are being eroded. We have to try and educate the market to understand that you can't get something for nothing." Unsurprisingly, a number of cyber cafes have closed down and Maina believes that it will be 6-12 months before the market reaches equilibrium (Balancing Act News Update, #91).

Africa Online, with its approximately 190 E-Touch centers in Kenya, is the only real franchise operator in the country (Africa Online Website). According to the Africa Online website, there are E-Touch centers in the following 34 towns and cities: Athi River, Bungoma, Eldoret, Gilgil, Githangiri, Homaby, Kakamega, Kaimba, Kapsabet, Karuri, Kericho, Kikuyu Town, Kilifi, Kisii, Kisumu, Kitangala, Kutus, Likoni, Limuru, Litein Town, Machakos, Malindi, Maseno, Meru,

[24] These conditions include: not allowing Jambo Telkom to build its own infrastructure so that it has to purchase connectivity from Telkom at the same rates as other ISPs, requiring Jambo Telkom to file its audited accounts with the CCK (other ISPs do not), and the penalty of cancellation of the license if any cross-subsidization does occur. (CCK Press Release, 08/04/2002).

Mombasa, Nairobi, Nakuru, Nanyuki, Naivasha, Ngong Town, Nyeri, Rongai, Sultan Hamud, Thika, and Ukunda.

The current E-Touch centers are fairly basic and provide the operator with an Internet connection, marketing, and a 50% share of revenue generated. E-Touch has had a number of problems around the consistent presentation of its brand by its centers and the variations in quality of service and conditions present in the individual cafes. It is currently testing Phase II E-Touch centers which must offer customers a minimum of 10 PCs, a leased line of 64 KBPS, trained staff, advertising, and report into area managers. There will be 10 Phase II centers in Kenya and if successful the plan is to roll out 40 nationwide before expanding into other African markets (Balancing Act News Update #91).

When the E-Touch centers first opened it was recommended that they charge 5 Kshs per e-mail sent and 10 Kshs per minute of web browsing. To give a sense of the effect of the recent price competition, the Phase II centers will charge 3 Kshs per minute for web browsing and this is considered expensive compared to the 25-50 cent per minute offerings at the bottom of the market (Balancing Act News Update, #91). However, with a leased 64 KBPS line costing the operator $1,600 a month it is difficult to see how a cafe can charge below this price and expect to stay in business. Some cafes may be attempting to buy customers with their low priced offerings and hope to survive the industry shakedown by offering ancillary services such as telephone, fax, or even refreshments from an adjacent restaurant/cafe business (Balancing Act News Update, #91).

Cyber cafes have the same core problem as the ISPs; namely they are unable to control the quality and reliability of their service. Hence, customers also view the cyber cafes as an offering a commodity product to be selected among on the basis of price. Following the example of the ISP sector, the cyber café owners are attempting to force the government to address some of these issues through the formation of an industry organization/lobbying group. The Kenya Cyber Café Owners group (CC0), which was formed in early 2002, hopes to address bandwidth/connection issues, pricing, customer care standards, and to lobby the government for computer training in schools (Balancing Act News Update, #96).

The survival of the cyber café industry also has implications for rural areas. Given the preponderance of the income effect in terms of access to ICTs one of the key mechanisms that is being explored in the ICTs and development field is demand aggregation. It is hoped that by offering telecommunications services from a centre, where users would pay only for the service as they need it, that provisioning of these services to low income groups can be made sustainable. In January 2002 there were approximately nine multi-purpose telecentre projects based on this general concept that were either planned (seven) or active (two). Given the expensive funding that these centres require and the international experience of problems with the sustainability of these initiatives privately operated cyber cafes (and other centres offering basic telecommunications services) will have an important role to play role in aggregation of demand for telecommunications services in rural areas.

While these private centres and cybercafes may not have explicit development goals, as Benjamin (2001) states they are generally quite successful because if they weren't they would have closed down. These types of centres are already more widespread (AfricaOnline by itself has cyber cafes in 34 towns and cities) than donor funded telecentres are likely to be for some time if ever. Given the low incomes in rural areas, at least for the foreseeable future, these privately run telecentres are going to be the only demand aggregation mechanism for ICTs available in the majority of rural towns. In this context, competition in JamboNet's Internet backbone service and the provision of satellite Internet access is also important for the cyber café industry. The cyber cafes are currently at the end of an Internet access supply chain that begins with JamboNet and is resold by the ISPs to them. They therefore face the same core problem of high prices and low service quality provided by Telkom as do the ISPs and it is having a similar detrimental effect on their long term business prospects.

Satellite

On December 18th 2001 the CCK licensed a second Very Small Aperture Terminal (VSAT) Network Operator to offer VSAT communications solutions to users within the country. The license allows Gilat Alldean Ltd. to provide VSAT services to closed user groups (such as banks and hotels), network operators (such as the RTOs when licensed), and ISPs. Gilat will compete with Telkom subsidiary KenSat, which until now has operated the country's sole VSAT facility in Kericho. Gilat will be allowed to operate a network control facility (hub) to transmit data within Kenya. However, the operation of international commercial VSAT networks and service will remain the preserve of Telkom until the expiration of its exclusivity rights in 2004.

The liberalization of VSATs has remained a strong point of contention and dissatisfaction for ISPs due to their continuing problems with JamboNet and the fact that corporations are able to operate VSAT networks for intra-corporate data communications. This means that the corporations can operate data services that the ISPs themselves cannot and thus makes it difficult for ISPs to sign up the large corporations with VSATs as clients. An official at one of the major ISPs believes that the second license was granted to Gilat Alldean because it helped the Kenyan military set-up a communications network and that Gilat Alldean is simply a holding company with the Gilat name (not affiliated with Gilat Satellite Systems worldwide). This official believes that if/when Gilat Alldean sets up a hub it will be located in London, requiring long satellite hops to provide intra-country service to users in Kenya.

In only licensing one competitor to the incumbent VSAT provider the CCK is trying to follow the model that it has used with the cell phone operators. Francis Wangusi, Head of Telecommunications Development at the CCK, expressed hopes that the licensing of the second VSAT operator will have a similar effect on the VSAT market as the licensing of KenCell had on the GSM market. If the demand for VSAT services proves to be robust enough, the Commission will consider the licensing of a third operator[25].

While VSAT has the advantage of offering highly reliable two-way data services to any location within the country and as such has the potential to overcome a lot of the problems with the fixed line infrastructure in Kenya's rural areas. However, given the lack of competition KenSat's tariffs are beyond the means of most rural institutions:

[25] It would not appear that user demand will be a problem. According to an unidentified person's statements in the Balancing Act Website's Special on Kenya, there are currently at least five unlicensed VSAT operations in Kenya.

TARIFFS FOR VSAT SERVICES - KENSAT

Hughes Personal Earth Station (PES) Prices:

ITEM	US$
SET UP CHARGES	
Order processing and commissioning per terminal	227.00
EQUIPMENT AND ANTENNA INSTALLATION	
(b) Survey per terminal	462.00
(c) Installation per terminal	1,383.00
EQUIPMENT AND ANTENNA RECOVERY	
(d) Recovery per terminal	1,291.00
MONTHLY CHARGES	
(a) Utilization Charges (Space segment)	
1 % Inroute utilization	30.00
1 % Outroute utilization	66.00
(b) Hub port (LIM) per port	245.00
TERMINAL EQUIPMENT	
(c) Monthly remote maintenance charge per VSAT terminal	46.00
(d) Rental fee for a PES 8000 terminal per month	589.00
(e) Purchase of a PES 8000 terminal	35,313.00
BACKHAUL CHARGES	
(f) Backhaul charge - Via Kenstream Link	KENSTREAM charge as if the hub was located in Nairobi. E.g. the current charge for a 64Kbps circuit per month is $6,150.
(g) Backhaul charge - via VSAT link	KENSAT charges

Source: Telkom Kenya Website.

At these prices it is obviously difficult to sustain an application designed to alleviate rural poverty. However, the affect of the licensing of Gilat Alldean as a second operator on hardware and subscription prices for VSAT services bears watching. It is possible that in the future competition within the sector may force the prices for these services to descend to the point at which it would present a feasible option for use in future rural poverty alleviation projects.

International experience indicates that VSAT technology is ideally suited for offering fast two-way data and voice services to remote and rural locations. The benefits of VSAT technology include “instant infrastructure” (as installation can be done quickly), low initial investment as compared to building out fixed networks, and depending on the regulatory environment low per minute costs following the initial hardware investments.

Specific examples of the use of VSAT technology used to roll-out services in rural areas include Telkom South Africa working to meet its Universal Service obligations through that installation of a 3,000 VSAT station telephone network to serve remote underserved areas (De Wet, 2002). More than 1,600 of these VSAT stations were successfully deployed in the first two months of the operation evidence, of the “instant infrastructure” appeal of the technology. In India an “open skies” policy with regards to competition in VSAT services helped lead to an expansion in Internet users from 250,000 in 1998 to 1.5MM by 2000 and a

twelve fold increase in the number of regular satellite based Internet users within a year (Global VSAT Forum).

Rural areas in Kenya would therefore obviously benefit from increased competition in the provision of VSAT services but despite lobbying from TESPOK and other bodies it is unlikely that this will happen before 2004. This is unfortunate for if ISPs were allowed to operate VSAT terminals, many more would offer service in rural towns. Indeed, David Hartshorn, Secretary General of the Global VSAT Forum believes that this sector is a perfect illustration of the 1998 ITU World Telecommunication Development Report's contention that "… universal access is now not so much an engineering or supply-side problem but rather a regulatory and policy challenge."

Radio

Including the government owned Kenya Broadcasting Corporation's Radio division, the CCK has licensed 18 FM sound broadcasters in Kenya. Of particular interest to projects aimed at the use of ICTs to alleviate rural poverty is WorldSpace, which broadcasts digital audio and data content from its AfriStar satellite in the 1467 - 1492 MHz band. In general 'Older' ICTs, such as newspapers, radio and television, have not received as much attention in ICTs and development literature as they are generally not thought of as potential mechanisms for the "leapfrogging" of developing nations into a qualitatively different level of development (Pyramid Research, 1999). However, as this section will demonstrate it is important not to ignore the qualities of radio which has an accrued history of meeting the information needs of the poor in developing countries in a cost effective manner (Kenny, 2002).

WorldSpace began service in Kenya in January 2000 and chose to introduce itself to the market as a provider of digital audio services. It focused initially on its "free" audio content and the sale of the digital receivers necessary to receive its audio programming. Although it is still perceived by most Kenyans as being a provider of audio content, WorldSpace is seeking to expand into becoming a subscription based service provider. To achieve this end WorldSpace offers a Direct Media Service where selected web content that is uplinked two to three times per day to WorldSpace satellites and can be downloaded via radio and stored on the user's hard drive.

While the Direct Media Service is not interactive (data can only be downloaded), and the content is limited to pre-selected websites, the service is accessible anywhere in Kenya at a rate 64 or 128 KBPS without the use of a phone line. The service may offer a potential project intervention for remote towns in need of access to agricultural and market information, but not requiring real-time contact with markets or buyers.

The bundled price for WorldSpace's hardware and subscription is relatively inexpensive, with options existing for both desktop and mobile laptop computers:

WorldSpace Digital Media Service Pricing		
Multimedia- Tier	**Subscription Period**	**Prices Kshs (Inc. of VAT)**
PC Adaptor* (For use with both laptops and desktops)	6 Months	6,800
	12 Months	11,300
PC Adaptor* + Receiver	6 Months	11,300
	12 Months	17,000
PC Card** (For use with desktops only)	6 Months	12,400
	12 Months	19,000
Existing Users	6 Months	4,720
	12 Months	9,440

* - Current generation does not require an external power source and allows for downloads at 64 KBPS. Next generation will be at 128 KBPS.

** - Allows user to simultaneously listen to audio broadcasts and download data at 128 KBPS.
Source: WorldSpace Kenya.

WorldSpace was founded by Ethiopian Noah Samara, and is involved in telecenter, distance learning, and telemedicine activities in Africa through its non-profit subsidiary, the WorldSpace Foundation. In Africa, the WorldSpace Foundation's Africa Learning Channel (ALC) sets aside spectrum for the broadcast of both audio and data content to development organizations and local communities. The ALC currently lacks agricultural content and according to Daniel Obom, Director of Technical Operations in Kenya, the WorldSpace Foundation may be interesting in uplinking agricultural content for use by specific communities as it does receive customer requests for this type of information.

Therefore, as the WorldSpace Direct Media Service demonstrates it is important not to forget 'old' media and to remember that their future impact on developmental processes might actually increase as they benefit from recent technological advances which give them the opportunity to be disseminated across new platforms. This is especially true given the radio's traditional status as the most widely accessed form of media in most developing countries due to its relatively low cost and complete national coverage. Radio is listened to every week by as much as 80 percent of the populations of many developing countries (Kenny *et al*, 2001). For example according to Miller Esselaar and Associates (2001) radio broadcasts remain the most widely accessed form of communications technology in Mozambique, reaching 60-70% of the population. By serving as platforms for relevant market information, small business training, and distance education applications digital and audio radio have a real contribution to make to poverty alleviation in rural areas.

In terms of policy issues around WorldSpace's Direct Media Service, Mr. Obom, Director of Technical Operations for WorldSpace in Kenya, is confident that the CCK will not have any regulatory issues with WorldSpace's services. Francis Wangusi, Head of Telecommunications Development at the CCK, has cautioned that thus far the commission has not taken a close look at the WorldSpace technology and that its services will be examined closer in the Broadcasting Bill being worked on currently. Although it appears unlikely, it would be a significant backward step for rural areas if this review would take these digital media services off the airwaves.

Analysis and Conclusions

Policy Impact on Infrastructure Accessibility and Affordability

In evaluating the state of the Internet sector in Kenya Southwood (2001) concludes that despite the state of the country's infrastructure, its regulatory regime, and the operating practices of Telkom, Kenya is on the map as a middle level Internet player in Africa. This conclusion could apply to Kenya's communications sector in general. In the areas where the first concrete steps towards liberalization have taken place, notably in the mobile telephony market, the country's demand and willingness to pay for quality telecommunications services are apparent. The success of this sector is due to a combination of progressive government actions on equipment taxes and approval, real competition, and the infusion of private sector capital. Hopefully, the lessons learned by resulting spectacular success in this sector can be transferred into other communications fields in the country; namely the provisioning of Internet services (both dial-up and cyber cafes), VSAT, digital radio, and the country's regional telephone operators. For this to occur, the CCK will need to continue to move towards becoming a truly independent operator and the government will need to put in place a national ICT framework to guide the sector and promote the development of the country's infrastructure and human capacity while providing the CCK with protection from interference from above.

From a standpoint of rural poverty alleviation, Francis Wangusi at the CCK highlighted the biggest problem with the provisioning of telecommunications and other ICTs in rural areas:

> "The biggest problem in the rural areas is not the lack of infrastructure penetration but the affordability of services to the local population. This causes an uncertain return for any party considering an investment in rural infrastructure and could lead to the rural population being bypassed."[26]

[26] Personal communication with the author.

With respect to this problem this paper has argued that the current policy framework and regulation in the Kenya is exacerbating this already extremely difficult challenge. Telkom Kenya's monopoly on fixed line infrastructure, international and long distance voice telephony, the Internet backbone, and until recently VSAT provision has had, and will continue to have, serious detrimental impacts on both the affordability of and access to telecommunications infrastructure in rural areas. This is all the more apparent when contrasted with the falling tariffs and exploding subscriber numbers in the mobile sector following the introduction of competition.

Given that 80% of Kenya's population and an even higher proportion of its poor live in rural areas this is a matter of serious concern. The policy environment is clearly making the economic return from investment in rural areas more uncertain. The failure of the Regional Telecommunications Operators to take up their operating licenses is hard evidence of this. This, combined with a public monopoly that has no real incentive to fulfill its universal service goals is resulting in a bypassing of the rural population. It is therefore argued that rather than subject Telkom to fines that are relatively insignificant (in terms of its revenue base) the competitive structure of the telecommunications structure should be re-visited prior to the scheduled review in July 2004. Liberalization of the sector is the only way to get network development and is even more necessary than the poor performance of Telkom alone would merit as it looks increasingly likely that the Regional Telecommunications Operators initiative will fail completely.

Implications for Rural Poverty Alleviation Institutions and Projects

What are the ramifications of the current accessibility and affordability barriers for those institutions hoping to make use of ICTs to alleviate poverty of the current policy regime in rural areas? A recent World Bank study[27] found that development assistance has a far greater impact on poverty reduction when targeted at countries with sound policy regimes and independent institutions. This study, which has received significant exposure, recommended retargeting aid towards those regions where institutions and policies would allow it to have the greatest impact. At the macro level this would therefore suggest that the current telecommunications policy environment in Kenya is

- Currently lessening the impact of development assistance on poverty alleviation in the country.
- Could cause some development agencies to bypass Kenya in the future as they seek better "returns" elsewhere.

This is a conclusion that is generally acknowledged in arena of foreign investment in the private sector telecommunication[28] but is not as widely understood in the ICTs and development arena. What this conclusion means is that similar to the private sector, donors (investors) may choose to avoid undertaking poverty alleviation projects in the country (make investments in local firms) because due to policy flaws there are opportunities to achieve better results (greater reduction of poverty) elsewhere.

As a concrete example of this concept, one donor agency that has placed a priority on promoting the use of ICTs did not originally work in Kenya when launching their program because the country was not perceived "as being supportive of ICTs and there were difficulties with the local infrastructure and regulatory regime"[29]. The agency instead chose to operate in other African countries where the policy environment was seen as more supportive and conducive to the development goals it was trying to achieve. Because of continuing problems in the Kenyan policy regime this agency has to date only attempted a limited number of pilot projects that involve ICTs in the Kenya. A fairly typical experience among these projects was a community ICT project aimed at improving the livelihood opportunities of

[27] Dollar, D., Burnside, C., and Collier, P. (2002). Assessing Aid – What Works, What Doesn't, and Why. World Bank.

[28] For example in South Africa a joint 2001 Ernst & Young and BMI Technology survey of local business leaders found that "the main theme, repeated time and time again…" as to what "the biggest inhibitors or challenges to growing a [telecommunications] business in South Africa…was the regulatory environment."

[29] Personal communication with the author.

local women. The project never got off the ground as Telkom would not connect phone lines to the chosen project location. If donors and those agencies responsible for the implementation of poverty alleviation project act in a rational fashion they will, like this agency, tend to concentrate their efforts where they are likely to be most effective, potentially leading to a bypassing of countries like Kenya where the policy regime is perceived as making it difficult to do their work.

This is the situation at the macro-level, what about at the micro-level? If an organization is committed to poverty alleviation in Kenya and would like to make use of ICTs in its projects they will find their options to be severely constrained. The following table presents a matrix of 34 Kenyan towns. The towns in the table were chosen for initial consideration by Bees Consulting Group's in its ICTs and Rural Poverty Alleviation Project by local experts[30]. The towns were chosen for consideration because of their economic potential, proximity to transportation networks, and state of local government.

[30] The towns were chosen by the Professor Karega Mutahi of Appropriate Development Consultants Ltd. in collaboration with researchers the Institute of Development Studies at the University of Nairobi.

Town ICT Infrastructure Matrix

Region	Small Town	Digital Exchange	Internet POP	E-Touch Center	SafariCom Coverage	KenCell Coverage
Coastal Kenya	Wundavi					
	Ukunda/ Tiwi	X	X (Diani)	X		X (Diani)
	Mtwapa			X		
	Malindi/ Watamu	X	X	X	X	X
	Kilifi	X		X	X	X
	Lamu	X				
	Voi	X			X	Y
Eastern Kenya	Sultan Hamud	X		X		
	Makindu				X	
	Mutito Ande					
	Mwingi	X				
	Ukasi					
	Kitui				X	Y
	Garissa	X				Y
Central Kenya	Nkubu	X				
	Nanyuki/ Naro Moru	X	X	X	X	X
	Isiolo	X			X	Y
	Karatina	X				X
Rift Valley	Naivasha	X		X	X	X
	Narok	X			X	X
	Marigat	X				
	Nyahururu	X			X	Y
	Namanga					
	Oloitokitok	X			X	
	Moyale	X				
	Mandera	X				
Lake Region	Ugunja	X				
	Kitale	X			X	X
	Webuye	X				X
	Busia	X			X	X
	Malaba	X				Y
	Isebania					
	Mumias	X				X

X – Currently Present, Y – Scheduled to be in place by July 2002

Sources: ISP Websites, Telkom Kenya, AfricaOnline, SafariCom, and KenCell.

As can be seen the list shrinks very quickly when ICT infrastructure criteria are included. For example, if a requirement for the project was access to the Internet at the relatively low cost of a local phone call, only three of the 34 towns would be available for consideration. Seven of the towns do not even have a digital exchange, making any sort of fixed line Internet access virtually impossible. And as the country's waiting list of 120,000 people indicates having a voice telephony requirement for the project might could also prove problematic. While the table indicates that cell phone access is increasingly widespread it also demonstrates that it has some way to go before covering many rural towns.

This table provides one form of how the effects of Kenya's telecommunications policy regime makes it difficult for institutions concerned with poverty alleviation to experiment with ways that ICTs could help to maximize the impact of their activities on poor individuals and the

economic environments in which they live. However, given the slow pace of policy reform in Kenya, and many other countries, this does not mean that these institutions should wait for the policy regimes to be perfect. While the policy regime increases the uncertainty factor of any intervention, not taking any action to integrate ICTs into the lives of the rural poor will only ensure that the effect of the information age on these peoples is negative. By initiating projects in those areas with relatively good (and affordable) infrastructure poverty alleviation institutions can test their models while providing further documentation and input into the policy reform process. That is what this paper has attempted to do.

Conclusion

This paper has examined the reform of the telecommunications sector in Kenya from a perspective of its effects on the poor. It has demonstrated that the policy and regulatory regime is hampering both the accessibility and affordability of ICT services to Kenya's rural poor. Rather than focus on the implications of this outcome on economic competitiveness, or other sectors where this link is well documented, it has instead shown how this outcome can hamper poverty alleviation efforts. This occurs at both a macro level and micro level. At the macro level donor agencies that are trying to achieve the biggest impact from their limited budgets may choose not to launch certain types of poverty alleviation projects in the country. This is because donor agencies are increasingly recognizing the role that ICTs have to play in development and their ability to help generate a greater multiplier effect from development dollars. The rational decision on their part is therefore to focus on those countries with policy regimes that are supportive of ICTs. At the micro level the uneven roll-out of national information infrastructure and the high cost associated with the services provided by the monopoly operator is a strong limiting factor on the number of locations that can support poverty alleviation interventions with ICT components. The combination of these macro and micro effects could result in the creation of a policy induced poverty trap at both a national and regional level in Kenya.

The conclusion that is reached from this in-depth review of the Kenyan telecommunications sector is that the twin problems of access and affordability could begin to be addressed by a revisiting of the numerous monopoly privileges enjoyed by government owned Telkom Kenya. Given the complete failure of the operator to fulfill the targets which were the condition of its monopoly, the breakdown of the country's Rural Telecommunications Policy, and the success of those sectors that have been liberalized it is argued that it is in the urgent national interest to introduce wider competition into the broadly defined sector.

What are the implications of these conclusions for poverty alleviation institutions? Firstly, as poverty alleviation institutions come to recognize the role that ICTs have to play in rural poverty alleviation, the next step will be to make local connectivity to ICTs one of the conditions for their projects. If ICTs are not available locally, it may be time for these institutions to start investing in ICTs so that their multiplier effects can be achieved. This could mean investing in local community operators when the opportunity arose[31], but more likely (and less costly), would involve investments in VSAT stations and other wireless technology in remote areas. The "instant infrastructure" appeal of VSAT, coupled with their falling hardware costs[32], will make them an increasingly attractive option for achieving this. It would also mean that those areas that are bypassed by the national telecommunications networks would have a hope of escaping from their policy induced poverty traps. Of course in Kenya, and in many other countries, the policy regime would not allow investment in either fixed or satellite infrastructure by entities other than the public monopoly. This leads to the second conclusion. Poverty alleviation institutions need to realize that they are in possession of resources that the government of Kenya, and governments in other countries, would very much like to see deployed in their country. This gives them leverage that can be used to

[31] One such current opportunity is available in South Africa, where the 2001 Telecommunications Amendment provisioned for the establishment of local cooperatives to build out telecommunications networks in areas where the teledensity is less than 5%. This would be one potential vehicle for poverty alleviation institutions to invest in telecommunications infrastructure in rural areas.

[32] According to the Global VSAT Forum the current hardware prices for VSAT terminals are $2,000 and could fall to as low as $200 over the next five years if demand volume increases to the extent that economies of scale in terminal manufacturing can be realized. In Kenya, because of the lack of competition, it costs close to $600 per month to rent a Hughes PES VSAT terminal.

lobby for changes in telecommunications policy regimes whose outcomes are perceived as limiting the accessibility and affordability of ICTs in rural areas. Once governments see that donors are making decisions on where to deploy their aid budgets explicitly based on whether the outcomes of national telecommunications policy are supportive of poverty alleviation they will have a strong incentive to make changes to their policy in the sector.

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