Chapter 5: Ethiopia

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INTRODUCTION. This paper provides the first comprehensive supply and demand-side analysis of telecommunications in Ethiopia. It is based on an analysis of the sector's performance, measured against national policy objectives that provide the context for the quantitative and qualitative demand side surveys conducted in 2004 and 2005. These surveys explore the usage and access patterns in Ethiopia from the perspectives of users and consumers and those marginalised from communications.

The first study involved a quantitative survey of urban and rural households on communications services usage and demands using a methodology developed by World Health Organization for their Expanded Programme on Immunisation (EPI). A total of 1,790 households and 1,826 individuals were involved in the survey. Data on the demand for communication services – including phones,

public access, email and the Internet – was gathered using reliable cluster sampling techniques and a comprehensive questionnaire.

The second qualitative study focused on gathering further information to enrich and address gaps in the first household survey using focus group (FG) interviews. A total of eight focus groups, involving 63 people (33 male, 30 female), was conducted.

Both surveys showed that telecommunications penetration and usage is inadequate in Ethiopia due to limited availability and affordability. Respondents regard communication as an important component of day-to-day life, and users travel long distances or use different ingenious strategies to access it. However, ICT policies and rollout strategies do not appear to have taken the demands and usage patterns of people into consideration. The findings suggest that the government should consider usage patterns as a basis for developing its universal access strategies; after all, communications should meet the needs of the country's citizens.

OVERALL ICT SECTOR PERFORMANCE IN ETHIOPIA. Although the situation is improving – admittedly, from a very low base – the telecommunications sector in Ethiopia is still characterised by low penetration and a growing waiting list for fixed services, unsatisfied demand in the mobile sector, and a low-quality Internet services sector influenced by a strict public monopoly and ineffectual regulation. Despite the establishment of an ICT coordinating body, the Ethiopian ICT Development Authority, ICT sector development in general, and telecommunications and Internet services in particular, continue to be treated in an ad hoc manner where various sectors and institutions address their needs and concerns independently and projects are implemented on a trial

National Indicators	
Country	Ethiopia
Location	Eastern and Horn of Africa
Total Area	1,127,127 sq km
Land Mass	1,119,683 sq km
Population	73,000,000 (est. 2005)
Population Growth Rate	2.36%
Labor Force	2.2%
Percentage of population below a poverty line	44%
Urbanisation	16%
Life Expectancy	42 years
Child Mortality	11.4%
Percentage of population with access to drinking water	
Illiteracy rate	59%
GDP per capita	US$120
Structure of the Economy	Agriculture 42%, Industry 11%, Service 47%

and error basis rather than within a coordinated national framework, resulting from an engagement with civil society and the private sector. The incumbent, rather than the regulator, establishes communications targets, the policy-makers decide rather than the public. Consequently, there has been a limited assessment of the performance of the sector against goals, demands of the user and overall needs of the nation both in accessing and providing ICT services. This next section discusses a brief overview of the telecommunications sector performance, followed by the findings of the household and individual survey that analysed demands for communication services from the lens of users.

TELECOMMUNICATION SECTOR GROWTH AND VALUE.

The government, through the monopoly incumbent, the Ethiopian Telecommunications Corporation (ETC), continues to invest in fixed, mobile and broadband services following its commitment to improve access to rural areas along with the strategy for decentralisation of public institutions and services to district (Woreda) levels. Capital investment jumped from US$29.1 million in 2002 to US$128 million in 2003. Although the implementing capacity of the incumbent has been a major shortcoming, the capital budget doubled in 2004 to US$300 million and is expected to rise to about US$500 million in 2005. It is too early to predict the intangible and tangible social and economic benefits of the current investment, as most of the projects are only

Figure 5.1: Contribution of fixed, mobile, Internet to gross revenue

becoming operational towards the end of 2005.

Telecommunications revenue grew from US$104.4 million in 2002 to US$118 million in 2003 and to US$132 million in 2004, representing an annual growth rate of about 14%. Annual revenue remains within the range of 1.7% to 1.9% of the GDP, a low figure when compared to neighbouring countries and the African average of over 3% (ITU 2004 and ETC Annual Reports).

The mobile sector is growing in terms of revenue and number of subscribers since its slow start in 1999. The number of cellular subscribers is expected to reach one million and bypass that of fixed line subscribers by the end of 2005, although at the time of this projection it stood at around only a quarter of this. Cellular represented 16% of the gross revenue of the incumbent in 2003 and this has jumped to 22% in 2004. The incumbent had 155,534 cellular subscribers by the end of September 2004 and a revenue of Birr 252 million, giving an average revenue per user (ARPU) of Birr 135 (US$15) – almost half the ARPU of Birr 268 (US$30) in 2003. Many cellular phones were installed towards the end of 2004 and made a late contribution to the gross revenue and ARPU; however, it is evident that ARPU is declining as mobile begins to reach the lower end of the economic strata. The estimated ARPU in 2005 is about Birr 70 (US$8), the lowest in the world. This shows affordability is the major bottleneck to improved communications services in Ethiopia.
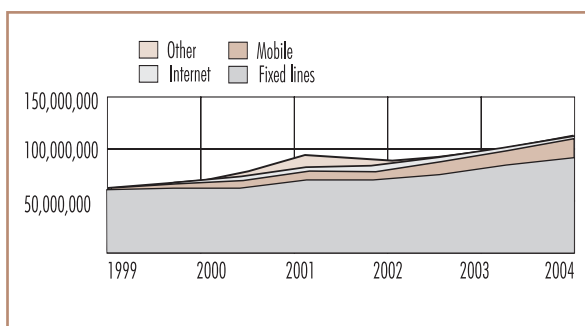
Figure 5.2 shows that the contribution of the Internet to gross communications revenues remained flat. Despite reduction of tariffs by 60% in 2002 and 2005, the incumbent is unable to attract Internet subscribers. The low quality of service, coupled with high costs and limitation of broadband services, makes Internet services inaccessible to the majority of subscribers. Although the quality of the infrastructure has improved with a recent introduction of a broadband

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Internet service, the quality of service leaves much to be desired. The cost of broadband access is still high, with a monthly subscription of about US$15 per kilobyte. This is in contrast to the global benchmark of US$2-5$ per kilobyte per month. This points to the fact that the Internet may be better served through competition.

ACCESS. Access to fixed phones showed a modest increase in 2004. The exchange capacity of fixed telephone lines rose by 11.12%, from 649,593 in 2003 to 722,548 lines in 2004, of which 97.3% were digital. There were 486,368 subscribers by September 2004, a 19.7% increase from the previous year. The effective teledensity rose from 0.6% in 2003 to 0.68% in 2004, still a very low figure when compared to the sub-Saharan African average of 2.68% in 2003.

Moreover, the incumbent has been unable to meet a growing demand for fixed lines and reduce the waiting time. The pent-up demand is staggering. The registered waiting list for fixed lines jumped from 146,062 in 2003 to 156,963 in 2004. These figures represent about a third of those who are already connected, and conservative estimates of non-registered subscribers put the figure of those waiting for their first phones to well above a million. The average waiting time was 2.7 years in 2002 (ITU, 2004).

Although efforts were made to connect rural areas, particularly district towns, along with a government policy to decentralise the public administration and make services and utilities available to the rural poor, access to remote areas remains limited. Over 60% of the exchange lines and subscribers are in Addis Ababa and its surrounding towns (within about 100km radius and population of about 5%). The zones that are enjoying the highest degree of connectivity are the southern and eastern zones, where the principal cities such as Nazreth, Dire Dawa and Harar are located. There has also been considerable expansion in the northern towns of Mekele

and Bahr Dar, which saw sizeable economic activity in recent years. Positively, the household subscriptions of telephone networks in cities are relatively high compared to other countries. Of the four categories of subscribers in cities and towns, residential subscription accounts for 72.5%, business 16.6%, government 8.6% and international organisations 2.3%. By contrast, the international, business and government segments contribute substantially to the incumbent's revenue.

Mobile subscriptions have been growing and are making up for the lack of adequate fixed lines in Ethiopia. However, access to mobile phones has been very limited, with a high pent-up demand. In September 2004, there were 168,223 registered subscribers waiting for their mobile phones, while the number of subscribers was 155,534, a minuscule figure compared to African countries of comparable population size, even when affordability is taken into account. For example, there were 5.8 million cellular subscribers in Egypt in 2003, where there was competition. Egypt is a country with a GDP 10 times that of Ethiopia, but compares in terms of population size. Ethiopia had only 51,000 mobile subscribers at that time, 100 times less than that of Egypt.

Given the highly successful "pay as you go" business model that suits countries like Ethiopia with low per capita incomes, and an increasing availability of cheap handsets, conservative estimates put the number of those waiting for their mobile phones to 3.5 million (about 5% of the population). The number of pre-paid subscribers grew sharply since the introduction of "pay as you go" in 2002 and has currently reached 70% of total subscribers. The incumbent has plans to raise the figure of subscribers to over one million by the end of 2005, of which most will be pre-paid (ETC, 2005).

INTERNET. The Internet market in Ethiopia is less developed, given the demand and the size of the
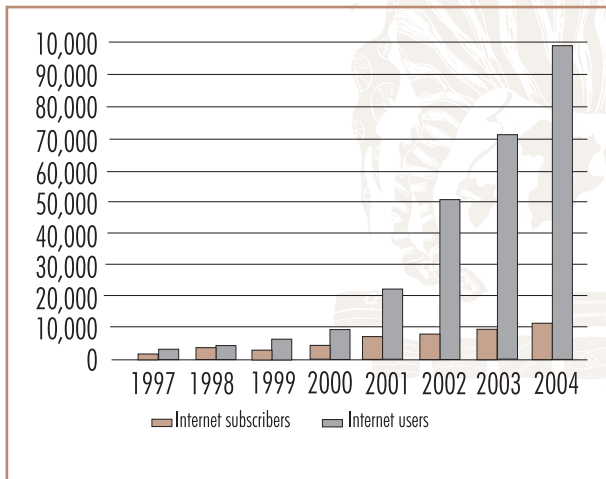
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Figure 5.2: Internet Service Growth

population, mainly due to the monopoly of ISP services by the incumbent. Although Internet charges are relatively affordable compared to some other African countries, the number of subscribers remained almost constant. ETC had 10,465 subscribers in 2003, of which the majority were business and non-profit organisations. This figure grew by 14% to 12,155 in 2004 – still a small number compared to the Ethiopian population size of more than 70 million.

The quality of the Internet service leaves much to be desired. Access to the Internet has been erratic and painfully slow, often prompting users to download email and files at night. However, the introduction of a broadband Internet service in 2005 is expected to increase nationwide presence by a total of 16 points of presence (PoPs), eight of which will be in Addis Ababa. According to the incumbent, the broadband Internet network was built around two fully redundant PoPs in Addis Ababa and was expected to cater for up to 100,000 dial-up customers and 3,000 broadband users. The network has the capacity to connect over 3,000 dedicated Internet customers with links between 64Kbps and 8Mbps using asymmetric digital subscriber line (ADSL) or fixed wireless access (FWA) devices.

Such improved functionality and accessibility should attract more dial-up and broadband users, but in practice the cost of access has not come down sufficiently to promote widespread use.

The number of Internet users is growing in major cities like Addis Ababa due to the increasing popularity of cyber cafés. There were about 100,000 Internet users by the end of 2004. So far, Internet penetration in rural areas is generally limited due to the poor quality of line and services and the lack of access to computers. Internet PoPs are available in major towns like Mekele, Nazreth, Bahr Dar, Awassa, Jima, Dessie, Gondar, Nekempte and Dire Dawa, where users make local phone calls to get access; however, the poor quality and limited accessibility of fixed lines makes it difficult for the majority of users to have the patience to keep on dialling. In addition to providing local dial-up service, the PoPs sell leased line connections to institutions in those towns. Nevertheless, the distribution of Internet users is still strongly skewed to the capital, that provides 94% of Internet users.

VAN AND BROADBAND INTERNET ACCESS. Value-added network services (VANS) (including paging, private voice and data connections to satellite), public telephone, mobile trunked radio and other broadband services all fall under the monopoly of the incumbent. The ETC does not keep a separate account for its VAN services and it is difficult to assess the contribution of VANS to overall revenue. However, it is evident that the sector is growing fast.

The ETC introduced its first five leased lines to consumers in 1999, followed by another five in 2000. A major change did occur in 2001, following the introduction of a dedicated digital data network (DDN) service that provided the ETC's underlying broadband infrastructure with a frame relay connection of up to 2Mbps, although the maximum speed that was available

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for subscription was 512Kbps. In addition to customers in Addis Ababa, the DDN service was then available to subscribers in nine other towns: Bahr Dar, Debre Zeit, Dire Dawa, Awassa, Mekele, Nekempt, Nazreth, Jimma and Dessie.

In 2003, under new management, the ETC issued a strategic plan with a focus on improving its broadband technology to the next-generation networks, diversifying services to meet growing demands for broadband connectivity. It launched nationwide broadband multimedia and Internet network projects that were completed in 2004 and 2005 respectively.

The broadband multimedia network, inaugurated in June 2004, comprises optical network systems with a 2.5Gbps optical ring that interconnects telecommunication services within the capital, a multi-service switching IP/ATM system that provides integrated switching for multimedia traffic in the capital and other regional towns like Bahr Dar, Mekele, Dessie, Debre, Zeit, Nazreth, Dire Dawa, Awassa and Jimma, and a broadband access service to clients through ADSL, FWA and Aironet wireless access.

The network provides virtual private network (VPN) through multi-protocol level switching and broadband Internet access. (ETC Quarterly Bulletin, August 2004)

The number of VANS subscribers has grown ever since. There were 15 broadband subscribers, ranging from major banks to federal government offices, that now rely on broadband VPNs for their financial and other mission-critical transactions. The number of ADSL subscribers in Addis Ababa had reached only 30 by September 2004 but is expected to grow as users become aware of the potential of the service and as the quality of Internet services improves with the introduction of the broadband Internet service in March 2005.

COLLECTIVE ACCESS POINTS. Despite efforts by institutions like the British Council, the United Nations Educational Scientific and Cultural Organization (UNESCO) and the Organization de la Francophonie to introduce pilot community centres throughout the country, Ethiopia has limited experience of public telecentres. Conversely, there has been a long tradition of private access points in the country. Hundreds of village telephone kiosks (souks) have been operating for over 20 years, providing telephone services "illegally" because they were contravening the policy that makes ETC the sole provider of telephone services. Kiosk phones tend to have high mark-ups on their costs with limited services.

Only with the introduction of licensed private phone service providers, now called telecentres, in 2004, were the kiosks forced to reduce their tariffs. Although expanding recently, there has been limited access to public payphones, which are far cheaper than both privately-owned telecentres and village kiosks that sell telephone services with other amenities.

Internet cyber cafés began to appear on the scene in 2000 and their numbers have been growing in the capital and spreading throughout the country. Like village kiosks, cyber cafés were originally discouraged because they were contravening the policy that makes ETC the sole provider of ICT services. The incumbent's apprehension about VoIP led to the forced closure of a number of cyber cafés in 2001 and 2002. However, they remain resilient to the challenges and continue to grow in number.

Despite the poor quality of the dial-up connection, which in itself is shared among five to six cyber café users, there has been a considerable increase in the usage of cyber cafés, particularly by visitors to Ethiopia, people with relatives outside of the country and students. Cyber café users can be grouped into:

- Regular users, who access the web for over 10 hours a month (visit cyber cafés two to four times a week);
- Occasional users, who use cyber cafés once in a while, often for less than 10 hours a month; and
- Seasonal users, who visit cyber cafés less than five times a year. These visit cyber cafés only upon specific needs (e.g. diversity visa applications).

Addis Ababa now has over 200 cyber cafés and the demand for the service has been increasing throughout the country, particularly following the requirement of the United States government to accept online forms for the popular lottery. Most of the cyber cafés have side businesses such as printing, photocopying and sale of stationery products. Moreover, the majority of cyber cafés are engaged in assisting local visitors in composing and printing Amharic texts and filling out and submitting various forms.

The fees for cyber cafés in Addis Ababa vary from Birr 0.20 to Birr 0.35 a minute, with the majority charging Birr 0.30 a minute. The per hour charge ranges between US$1.40 and US$2.40, with an average of US$2.1 an hour. This is relatively high, given the ability of many people to pay for Internet services.

Notwithstanding the public monopoly of communications services, Ethiopia has an original policy with regard to universal access. Unlike many other countries, the Ethiopian government has shown ingenuity in expanding the access to the rural areas. In 2003, the incumbent launched a broadband VSAT network for connecting 560 secondary schools, of which 370 were connected.

The government has also launched a project to connect all of its 611 districts to improve public service delivery and the flow of information between civil service institutions. Plans are underway to connect 18,000 farmers associations, each equipped with computers, telephones, Internet access and fax, through a rural connectivity project. If successful, the rural connectivity project aims to wire the whole nation and provide employment opportunities for more than 36,000 graduates of technical and vocational schools.

However, there is an overall absence of private sector participation in most of these high-profile government initiatives, including the promising rural connectivity project. The achievement of cyber cafés so far shows that the private sector could play a key role in promoting universal access to information and communication in Ethiopia. The success of these initiatives depends heavily on the participation of hundreds of entrepreneurs, including rural cooperatives.

PRICING AND AFFORDABILITY. The incumbent has not adjusted tariffs for local calls and domestic long-distance calls in the last eight years. The international long-distance tariff was revised downward in 2003 in response to increased usage of callback operators (mainly Europe and America) and competition in the long-distance market.

As a consequence, a tariff reduction of more than 50% was achieved in international calls to America and Asia. All long-distance international calls now cost the equivalent of US$1.15. This is in contrast to the previous pricing regime that charged international tariffs based on geographic regions such as Africa, Asia, America and Europe.

Ethiopia's telephone connection charges, the PSTN tariff and cellphone charges are relatively low compared to many other African countries. A three-minute local mobile call is comparable in price to that of more competitive or advanced markets like Botswana, Egypt and Ghana. The ETC also made significant downward revisions to its Internet pricing in 2002. However, income has not changed in real terms over the last 10 years, and even with the lower charges, the cost of communication services remains

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Cost of telecommunications (1 US$ = Birr 8.67)	Cost of Internet bandwidth
Connection fee: Birr 305 (US$35)	Connection fee: Birr 156 (US$18)
Monthly rental: Busines: Birr 17 (US$1.96) Residential Birr 8 (US$0.92)	Monthly rental fee: Birr 69 (US$8)
Local calls: 0.2 Birr for 6 minutes (US$0.02)	Set-up/configuration fee: Birr 60 (US$7)
Monthly telephone charge for 30 hours	Internet usage fee schedule: Up to 900 minutes: US$8; 900-1,800 minutes: US$8
Rental+subscription+15% VAT: Birr 75 (US$9) Business 17+200*.2+8.55: Birr 88 (US$10)	Monthly fee for 30 hours Subscription fee +rental fee+15% VAT: Birr 140 (US$16)

Figure 5.3: Internet service charges in 2005

high for the majority of Ethiopians. The GDP per capita in purchasing power parity has shown only a modest increase of about 14% over this period. 30 hours of Internet usage costs about US$25 and represents a third of a salary for schoolteachers or nurses in Ethiopia.

EMPLOYMENT AND REMUNERATION. The ETC's services are bundled and it does not have disaggregated figures for those working in the fixed line, mobile and Internet segments. The phone lines per employee (including cellphones) ratio currently stands at a spectacularly low 74 – three times lower than the international productivity rate of 200 for fixed lines. ETC had 7,900 employees in 2003 with a low level of productivity, maintaining excess and unqualified employees. An additional 1,288 employees joined the Corporation in 2004. The total number of employees was 8,619 by September 2004, of which 30% were women and 6% had a university degree. The majority of the employees are in the low remuneration category with an average salary of US$105 per month. 48% of the staff earned less than US$100 a month and another 40% earned between US$100-200 in 2004. Conversely, the contribution of the telecommunications sector to national employment has been rising, as ETC continues

to outsource construction and earthmoving work to villagers throughout the country. More than 10,000 daily labourers benefit from ETC construction work annually.

POLICY DEVELOPMENT AND PROJECTIONS. Ethiopia's monopoly market structure and a policy where a sole operator provides fixed, mobile and Internet services has been a major stumbling block for innovation and widespread access to communication services. Although access to telecommunications has improved over the last two years, it trails far behind the levels of access in other countries.

The market structure for telecommunications was fundamentally shaped by two pieces of legislation: Proclamation 49/1996, which established the regulator, the Ethiopian Telecommunications Agency; and the Council of Ministers' Regulation No 10/1996, which established the ETC as a public enterprise with a monopoly over telecommunications services. In effect, this regulation just extended the monopoly of the incumbent. Ever since, the incumbent has become increasingly entrenched, steering the pace of the communication sector while the regulator has remained relatively weak.

The incumbent operates as a commercial company with its own budget and a board of directors that decides the company's strategy while at the same time holding the monopoly on all services. Following restructuring in 1996 and the withdrawal of funds from the World Bank and other donors, ETC was allowed to reinvest its net profits in infrastructure development. Its current projects are financed through revenues, except for long-term loans from the African Development Bank and the European Investment Bank.

Subsequently, with pressure from international financial institutions, there have been attempts to introduce regulated "competition". Although the investment proclamation No 116/1998 stipulates that

private investors shall be allowed to participate in telecommunications services in partnership with the government, this has not happened. A search for a strategic investor that could bring fresh capital, transfer of technical expertise, implementation experience and management skills was activated in 2002. The possibility of selling parts of the ETC to private partners was then explored, with a consulting firm, PriceWaterhouseCoopers, undertaking audits of ETC assets. An international tender calling for private participation in the telecommunication sector followed.

However, the selling-off of shares of the incumbent was called off, partly due to uncertainties as to how to achieve strategic partnership and the government's apprehension about the impact of telecommunications liberalisation in a rapidly changing global environment. The lowered appetite for global investments in telecoms contributed to the reversal. Government instead resorted to overhauling the management of the ETC and adopted a "wait and see" approach rather than pursuing the strategic partnership route.

Some progress has been made since the overhaul of the ETC management in 2003. The introduction of a broadband multimedia and Internet network that connects secondary schools and remote districts using VSATs, the launch of graduate schools on ICTs and the nationwide rollout of mobile services are among the recent achievements. Ambitious plans are under way to roll out 4,000km of fibre optic backbone infrastructure to connect up to 250,000 fixed line and 625,000 cellular subscribers and to link more than 3,000 remote villages using a combination of fixed and wireless technologies. The incumbent has also plans to raise the current number of VANS users from less than 20 to 220 and enlist 100,000 Internet subscribers to access its broadband multimedia and Internet services, inaugurated in March 2005.

Experience suggests that despite increasing investment, the red tape and bureaucracy in implementing projects, lack of incentives and a lack of coordination between various ETC departments and government institutions makes these projections rather ambitious.

Moreover, the incumbent needs a sustained investment to roll out next-generation networks and to improve ICT infrastructure to a level that meets the growing demands. Notwithstanding its growing profits and the introduction of a multimedia and broadband network, the incumbent is unlikely to be able to attract more finances to roll out infrastructure, introduce new services and improve its technical edge without exposure to new skills through gradual liberalisation of the sector. ETC's reputation for low levels of innovation and poor quality of services will not go away without aggressive exposure to new technologies, management and marketing skills. This can only be achieved by changing to a competitive market.

However, despite pressures from international financial institutions to open up at least some value-added services, such as Internet service provision, to private operators, the unyielding monopoly regime remains strong in Ethiopia. Close observation shows it is unlikely that liberalisation will follow the current management overhaul in the short term. Policy-makers have been cautious, and there are no incentives to pursue privatisation:

- The ETC is operating at a profit and reinvesting its revenues in infrastructure development. Investment has skyrocketed recently from US$29.1 million in 2002 to US$500 million plus in 2005.
- There are general concerns about the consequences of liberalisation on job security of ETC staff.
- The domestic private sector that would have provided an alternative avenue for telecoms service

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provision has little or no experience in telecommunications investment and is unlikely to provide the investment capital required.

- The equity market that would stimulate financing and competition is absent, and it may take sometime to create one.
- Some projects drawn up by the incumbent, such as the rural connectivity projects, are proving effective in promoting universal access.
- There is a general feeling by the incumbent that it is doing a great job, therefore promotion of competition is unnecessary.

Moreover, the government continues to argue that liberalisation will not result in positive changes, due to the profit motives of the multinational companies interested in the telecoms market. There is growing anxiety about whether transnational communications corporations will be sensitive to citizens' needs, particularly in deploying communications to the rural areas where it is needed most. The overall policy atmosphere is now focused on promoting the expansion of rural communications through a rural communication project (RCP), while improving the internal capacity of the incumbent to deliver both Internet-enabled services and broadband infrastructure at all levels.

The weak regulatory framework has also contributed to the cautious stance adopted by the government. A successful transition from monopolistic to competitive market often requires bold regulatory interventions that are currently absent in Ethiopia. Without good regulations, some argue that a policy process can hardly foster genuine competition and investment; in fact, it may lead to economic opportunities for corruption or a private monopoly that may not have linkages to the broader national development goals. Others argue that the lack of

independence by the regulator would make it difficult for it to develop the capacity to foster access by combining market efficiency and public interest objectives.

The weakness of the regulator has been compounded by a number of institutions competing for leadership in the ICT sector. These include the Ethiopian Science and Technology Commission, that has been responsible for the development of ICT policy in collaboration with donor agencies like the United Nations since 1999; the newly-established Ethiopian Information and Communication Technology Development Agency, that focuses mainly on implementation of ICT projects; the incumbent ETC, with stakes in all ICT projects, including rolling out communication to schools; and the Ethiopian Broadcasting Authority, that has parallel duties with the Ethiopian Telecommunications Agency in the broadcasting sector.

Building the capacity of the regulator and merging different institutions competing for ICT policy and programmes would help to manage convergence, as seen from experiences in multi-sector regulation around the world. This would not only boost the effectiveness and cost benefit of a single entity, but may also improve the independence of the regulatory body and the coordination of policies and programmes at a national level. Approaching the sector from a position of convergence would also strengthen the government's capacity to formulate and oversee broad-based ICT policies and programmes that make ICTs truly accessible to the poor.

AREAS FOR STATE INTERVENTION. The potential for telecommunications development in Ethiopia is high because of the pent-up demand and the current high costs and poor quality services. Demand for mobile and fixed phone lines is high. At least 20% of households can

potentially own both fixed and mobile telephony. While current efforts by the incumbent are commendable, there is still a large gap to achieve a minimum level of ICT access to participate in the information society. This implies a need for a rollout of more than three million fixed lines and another four to five million mobile lines within a couple of years. This undoubtedly requires investment and advanced skills for next-generation networks.

The government is committed to investing in the communications sector. However, experience shows that public capital alone may not sustain infrastructure development in the longer term. The weak implementation capacity of the incumbent so far indicates that even if the resources were available, it would not be able to absorb and execute projects that meet the growing demand and the introduction of innovative technologies in time. Observation shows Ethiopia lags three to five years behind other countries in introducing innovations to the ICT sector. The red tape and limited innovation in pricing and marketing means public resources could be wasted if users do not get the services when needed due to high costs and slow deployment.

Quick progress in the telecommunications sector often demands technical capacity that is difficult to build overnight. The ETC has set up a graduate school on ICT that aims to train students in advanced telecommunication engineering, IT and telecommunications business administration, which would ultimately contribute to the skills pool in this dynamic area. The graduate school covers subjects such as mobile communication technology, computer networks and security, software technology, data management, multimedia data management, Internet and web-based services, and has an ambition to become a centre of excellence for the telecoms industry at national and continental level. Although a graduate school is a good

step forward in improving the level of telecommunications skills, observation shows that the new generation ICT skills require direct hands-on experience of cutting edge technologies, improvisation, learning by doing and access to industry insights that can only be attained either through partnership with foreign telecommunications companies or via competition. Progress in the cellular market and wireless networks has already shown that new and smaller companies that use cheaper next-generation networks perform better than the incumbents, who struggle with a hybrid of old and modern technologies.

In effect, the principal economic issue facing the Ethiopian ICT sector is not a lack of commitment, but rather one of efficiency and effectiveness. The government's rejoinder to this requirement is improving the capacity of ETC's top management. Although some effectiveness is expected through a management fix in the short and medium term, historical trends show that a monopoly is inherently inefficient and self-congratulatory, rather than promoting the advancement of the communications sector.

To sustain the current level of investment in infrastructure, policy-makers should pursue a mix of strategies that actively involve the private sector and promote transparent and predictable regulation. It is important that the government considers a gradual introduction of competition in the telecommunication sector to improve ETC's effectiveness and to promote the growth of domestic ICT industry. Experiences of other countries suggest that although privatisation or transferring telecoms from the public to private hands often creates incentives for efficient performances, better results are achieved by increasing competition outright. This suggests that Ethiopia will benefit far more through competition than privatisation of the incumbent, which is already operating at a profit.

A phased introduction of competition, starting with value-added services like the Internet, private voice and data connections to satellite and content provision, will not only provide cutting-edge technologies and better access to users, but will also improve ETC's competitiveness and service quality, particularly in the most profitable and legitimate areas of monopoly such as bandwidth wholesale and voice services. This will leave time-consuming marketing and customer-care activities such as Internet service provision to the private sector.

This would help the incumbent to adopt a competitive culture. The gradual introduction of competition would also help the government to experiment with various options that could increase value for the people. It would equip the regulator to be able to deal with emerging regulatory issues.

One area where experimenting with private participation becomes useful will be in the delivery of rural communication services. The private sector could play a key role in realising the rural connectivity project developed by the incumbent. The involvement of rural cooperatives and entrepreneurs in the delivery of rural communication would not only relieve the incumbent from managing large-scale and complex distributed projects, but also create opportunities for the regulators to play a key role in licensing and regulating service providers and in carrying out research on cost, infrastructure and technology needs and capacity issues. In short, the participation of the private sector in the rural communications project would enable the regulator to regulate.

The process would unleash creativity in financing rural communications using the popular reverse auction method, in adopting various models including shared access facilities such as telecentres in schools, libraries and clinics, and in utilising different technologies to provide services to diverse rural communities in Ethiopia. This would not only create employment opportunities, but could also have a spillover effect on the development of applications that meet local needs.

In addition, it is important for policy-makers to consider:

- Unbundling the communications market into fixed, mobile and Internet services;
- Granting more licences to the private sector in downstream services such as the public call centres, payphones, messaging services and cyber cafés so as to increase ETC revenue and government tax;
- Granting of licences for ISPs that buy and resell bandwidth, with other value-added services such as content development and network training. The private sector will undoubtedly introduce innovative ideas for providing affordable Internet services;
- Licensing of other VANS such as paging, installation of customer premises equipment and block wiring, private voice and data connections to satellite, trunk radio, website development, domain name reselling, web design and hosting, etc.; and
- Allowing the incumbent to attract the necessary capital, skills and technology through public and private partnerships.

It should be noted that for a gradual introduction of competition to meet pent-up demand and drive down prices, the government and society at large requires an enabling environment in which the private sector can operate effectively. This includes putting in place transparent and efficient regulatory frameworks and robust financial systems and reducing other barriers to competition, including the reduction of bureaucracy, speeding up licensing procedures and establishing and implementing efficient customs clearance procedures.

Above all, improvement in the telecommunications environment in Ethiopia cannot be realised without

revamping the regulatory framework. This demands building the capacity of the regulator to enforce good quality service, maintain transparency, protect consumers, promote an efficient use of resources such as radio spectrum and numbers, and provide guidelines for fair tariffs, interconnection and deployment of next-generation networks. For the regulator to prepare itself for the network economy, it should become independent both financially and in its decision-making process. It should be able to attract highly qualified staff in this complex field. Advanced regulatory training and education should be included in the newly-formed graduate school for ICT.

The government may also have to seriously consider merging of its ICT development agency and the telecommunications and broadcasting regulators, in line with global regulatory convergence trends. This would reduce the duplication of efforts, resources and expertise in this specialised field. Approaching the ICT sector from a position of convergence would strengthen government's capacity to formulate and oversee broad-based ICT policies and make them accessible to the poor by mixing available tools and technologies.

National household and individual ICT access and usage survey

The overall ICT sector performance outlined above shows that policy-makers and the incumbent have intensified investment in the telecommunications sector to increase the penetration of telephones and other communications services to meet government's commitments to decentralise public services to the district (Woreda) and village (Kebele) levels. The success of these efforts can only be determined by measuring their impact on users. Ethiopia has virtually no initiatives to study communications consumers. With a monopoly provider and no alternative providers of services to consumers, market studies are not conducted, nor are user patterns analysed to devise infrastructure rollout plans or establish universal access strategies.

The e-usage and access survey and focus group study were aimed at filling this gap in Ethiopia. The e-usage index and access survey was launched in May 2004 through the Unity University College's collaboration with the Research ICT Africa network. This was followed up with focus groups conducted in August 2005. The purpose of the e-usage and access survey was to analyse access, demand and ICT usage patterns in Ethiopia in response to services provided by ETC. The aim was to survey users and consumers in urban and rural settings with the use of reliable methodology, sampling techniques and comprehensive questionnaires to gauge the success of various ICT initiatives. The survey was the first to collect data on usage patterns of telecommunications services in Ethiopia. The aim of the focus group study was to gather further information to enrich and address gaps in the previous survey and gain more insight into users strategies in coping with scarcity of access and cost of services.

Methodology and sampling.
As described in Chapter 1 and Appendix 1, the quantitative survey used a methodology developed by the World Health Organization for their Expanded Programme on Immunisation (EPI) and is based on cluster surveying. The survey in Ethiopia used the EPI technique and covered three different geographic areas (capital city, urban and rural areas) that formed a primary sampling unit. This was then broken down into 60 enumeration areas that served as secondary sampling unit from which 30 households were selected randomly. The sample was distributed between these different geographic areas – major town (capital), 59%; other urban, 31%; and rural areas, 10%. This reflects the

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approximate distribution of communications services in Ethiopia. More than 60% of fixed telephone lines are concentrated in the capital and its environs.

The other urban towns surveyed included Assosa, Jijiga, Dire Dawa, Harar, Mekele and Nazreth. These towns are the capitals of regional governments. Two farmers' associations outside Addis Ababa (Nefas Silk and Akaki) and close to the towns of Assosa, Mekele, Nazreth and Harar formed the rural sample.

Of the 1,800 target samples, 1,793 households, covering 8,888 individuals, were interviewed successfully. This corresponds to a household size of 4.9 persons, slightly higher than the national average of 4.6 as per the national census of 1994.

The survey focused on gathering data on demand for communications services, including phones, public access, email and the Internet. The nine-page questionnaire, that was translated into Amharic, comprised 10 modules from household data to communications usage.

The household survey took place between July and September 2004 and involved 90 individuals who helped the researcher to gather data at the household level. The distance between survey areas created logistical challenges. In some cases, there was a lack of cooperation from government officials in allowing the enumerators to sketch maps of enumeration areas and conduct the household surveys. A substantial amount of time was lost in negotiating permission with public officials to conduct the study. The bureaucratic hurdles that had to be overcome points to a lack of a research culture and limited understanding of the value of research at all levels of government in Ethiopia.

While the quantitative survey was important in providing data on access and the patterns of use of different communication technologies, it had limitations in giving insights as how communication users adopt different technologies and cope with cost and access on day-to-day basis. A qualitative analysis of usage was important to gain better insights into individual strategies for coping with costs and lack of access to communications.

FOCUS GROUPS. A follow-up focus group study was conducted in August 2005. The sample of participants was drawn from a sample of enumeration areas that was used for the 2004 quantitative survey. The enumeration areas that were covered in the household survey in 2004 were first grouped under their respective sub-cities and samples of the enumeration areas were drawn randomly. Six of the focus groups were held in Addis Ababa and two in Dire Dawa. Four of the focus groups in Addis Ababa and the two focus groups in Dire Dawa involved both urban and rural residents. An equal number of women and men were involved in the focus groups. Participants ranged from their mid-20s to their late 40s. The distribution of the focus groups is as follows:

- all-youth focus group (one group from Addis Ababa)
- all-women focus group (from the suburbs of Addis Ababa)
- an all-professional and male focus group (one group from Addis Ababa)
- an all-single people focus group from Addis Ababa
- randomly selected focus group (two groups from Addis Ababa and two groups from Dire Dawa)

Occupation-wise, participants of the focus groups included employees of government and non-governmental organisations, those working in the informal sector and those without jobs. The groups were also mixed in terms of their usage of and access to a range of communication technologies. The majority of the participants were fixed line and public telephone users. Annex I provides a matrix of the participants in the focus groups.

The focus group discussions covered similar issues that were raised in the quantitative survey – use of private and fixed phones at home and office, usage of public phones, mobile phones and the Internet and the pattern of communications expenditure. The main aims of the focus group were to gain insight into the reasons for and the dynamics that influence decisions in adopting specific communications technologies, and to review the usage patterns of communications technologies from the perspectives of the individuals and groups. The focus group discussions were also meant to validate the results of the household survey conducted in 2004.

Focus group interviews are cheap and quick to conduct and create an atmosphere in which interaction between participants leads to relatively spontaneous responses and a high level of involvement. This leads to better insight of the issues under consideration. While focus groups provide a platform for sharing a pool of experiences amongst participants, thus providing a consensus on the most typical experiences and shared opinions, there is no certainty that individual behaviour mirrors group self-reported behaviour and the data generated cannot be regarded as a representative in a statistical sense. Nevertheless, qualitative surveys have become more important to gain insight into individual and group experience of communication services that could not be captured through a predefined quantitative questionnaire.

The focus group interviews in Ethiopia took place in August 2005 amid high political tension following the May 2005 election. Although the government lifted the ban on demonstrations and public meetings imposed in Addis Ababa soon before the start of the study, people were reluctant to take part in an "unknown" study. Getting their consent to participate required a lot of persuasion that the issues were exclusively about ICTs and thus "non-political".

All the same, there were participants who asked for further clarification about the profile of the moderator and their assistants, and whether what they would say would be broadcast. Taking pictures and recording voices, questions regarding the kind of messages they used to exchange through SMS, and whether they use VoIP were some of the sensitive issues that made some focus groups participants uncomfortable to engage in the interaction fully. This also reflects a lack of exposure to market research and fear of public expression.

DEMOGRAPHICS OF THE HOUSEHOLD SURVEY.

Geographic and age distribution. The household survey showed that the number of female household members is slightly lower than their male counterparts. This is consistent with national statistics (49.8% female, 51.2% male). The age profile was also in line with the national statistical data of 2003. 51% of those covered in the sample were under 19, comparable to the national figure of 53%. Individuals between the ages of 15-54,

Figure 5.4: Demographics

Age	%	Income	%
<10	24.5	<	
10 to 14	14.2	<100 Birr	51.4
15 to 19	12.4	101-200	23.8
20 to 24	10.5	201-300	8.2
25 to 29	10.2	301-400	6.3
30 to 34	5.5	401-500	3.5
35 to 39	6.7	501-600	2.7
40 to 44	4.4	601-700	0.8
45 to 49	3.2	>700	3.3
50 to 54	3.4	Total	100
55 to 59	1.3		
60 to 64	1.8		

Age	%	Location	%	Gender	%
65 to 69	0.8	Capital	59	Male	52
70 to 74	0.5	Urban	31	Female	48
75 to 79	0.3	Rural	10	Total	100
>79	1.2	Total	100		
Total	100				

and likely to use most of the communications services, represented 55.4% of the sample. Those between 15 and 29 represented about a third of the sample – a figure consistent with the national average.

About one-fifth of those responded to the survey were household heads and 17.2% were their spouses or partners. Close to three-fifths were children of the head and about 1.4% were grandchildren. Individuals with low levels of education and income reside in rural areas, although, according to the surveyors, urban poverty was more acute than expected. This is not surprising, given a steady migration of displaced people to urban areas over the last decade. The rise in urban poverty has a significant impact on the usage patterns of communications services.

About one-third (31%) of the individuals surveyed were married and half (18.3%) were single. 30% attended school, in line with the national percentage. A third have never attended any form of school.

The focus group study, on the other hand, involved a few individuals and was limited to Addis Ababa and Dire Dawa. Four of the focus groups in Addis Ababa and the two focus groups in Dire Dawa involved both urban and rural residents. One focus group was entirely women, while the other involved young people. As many women as that of men were involved in the focus groups. Participants ranged from those in their mid-20s to those in their late 40s. The groups were also stratified across different social, economic and geographic gaps – those from urban and rural areas, those with access/no access to the Internet and those with and without jobs.

EMPLOYMENT AND EDUCATION. The household survey showed that 27.2% of those who attended school have completed primary education. Interestingly, only about 1% had tertiary education, less than the national tertiary school enrolment of about 1.8%. The number of students that completed traditional (mainly religious)

education was 1.8%. This was found to be higher than those that completed pre-school (1.4%) and those with a diploma from tertiary institutions. About 40% of those surveyed indicated that they have difficulty in reading a newspaper, of which 32.7% cannot read at all. This is consistent with the view that illiteracy rates in Ethiopia are on the rise, following a decline in early 1980s through a compulsory literacy campaign. The national literacy rate was 42.7% in 2003.

A fraction of those surveyed (2.2%) were employed by non-family members on a full-time basis. Those employed by a family member represented about 4.1%. The majority were self-employed (12.6%). In fact, a quarter of those surveyed were self-employed (part time and full time). Agriculture and informal trade were cited as the most important sectors of employment. This signifies a predominantly informal sector employment in Ethiopia, which in turn has a substantial implication for the type of communication services used. People involved in this sector often prefer pre-paid mobile phones compared to other communication options.

The informal nature of the economy was also confirmed through income patterns. About a quarter (23%) of those surveyed earned less than US$13 (Birr 100) a month and those that earned over a US$100 (Birr 865) represented only about 1.14%. Even though some of those surveyed were reluctant to reveal their real incomes, the findings demonstrated low levels of earnings that do not correspond to the current pricing of communication services, particularly for accessing advanced services like the Internet.

This is not surprising, given the predominantly informal economy. The capacity to pay for communication services was the main issue that was raised during the focus group interviews. The participants indicated that they use a number of strategies to cope with the cost of communications,

including frequent use of public or office phones, relying on neighbours to transmit messages and locking phones to cut down unsolicited calls.

The ability to pay is one of the main factors behind low levels of Internet penetration and the difficulty in attracting customers, as those who can afford it have already connected. Only 29 individuals (0.1%) of those surveyed had email accounts. 50% of these had free email accounts such as Yahoo, 25% of those 29 individuals reported personal subscriptions to the Internet and the remaining had access to email at their workplaces.

FIXED LINE PENETRATION AND USAGE. There were 484,368 fixed phones in Ethiopia in 2004. This represented a teledensity of 0.68% and a household penetration of about 2.2%. Evidently, household penetration is generally skewed towards urban areas. The capital, Addis Ababa, and Assosa have the highest household penetration of fixed telephone lines. Figure 5.6 shows estimated household penetration of the towns surveyed based on national statistics and data on the breakdown between households and business subscription from the ETC.

The survey found a national household penetration of 5.2% that is comparable to Assosa and slightly higher than that of Jijiga, but higher than that reported by the incumbent. Household penetration of fixed phones in

urban areas like Addis Ababa could actually be smaller than figures in Figure 5.6. Most houses in urban areas are rented out to families that do not have access to the household phones. Rentals are often informal and the tenants do not have legal documents to apply for communication services. The number of rural fixed phones is generally insignificant. Wherever available, rural phone lines belong to established businesses or public institutions rather than households. Consequently, no household phones were reported in rural areas covered in the survey.

The scarcity of fixed lines, the difficulty in getting hold of them when needed and the cost of access were described as the main challenges facing communications users in Addis Ababa and Dire Dawa.

According to a 30-year-old woman who participated in the focus group discussions: "My family could not afford to subscribe for a fixed line before, and besides since we all work outside the house, we didn't find it important. Later, as we realised the inconvenience of receiving calls and messages from neighbour's house, we tried to apply, but we were told there is no fixed line in our neighbourhood."

Similarly the household survey showed that Internet penetration was minuscule, a situation confirmed by the focus groups. Only 0.14% of those surveyed indicated that they had Internet access at homes or get access in someone else's home. There were 12,155 Internet subscribers in September 2004, that gives an estimated household penetration of 0.04%. It is estimated that there are 100,000 Internet users, which gives a penetration of about 1.4%, that is higher than the finding of the survey. Even so, the current Internet penetration is one of the lowest in the world.

As expected, access to mobile phones was slightly higher than that of the Internet. The reported household

Figure 5.5: Estimated household penetration of fixed lines

Town	Number of telephones	Teledensity	Population July 2004	HH Size	Household penetration
Addis Ababa	264,754	9.4	2,805,000	5.1	34%
Asossa	1,556	1.6	97,109	4.5	5%
Dire Dawa	11,772	4.5	258,906	4.4	14%
Harar	6,742	3.6	185,000	4.3	11%
Jijiga	2,960	0.9	328,465	6.6	4%
Mekele	11,162	7.2	154,698	4.3	22%
Nazreth	12,783	3.2	390,574	4.4	10%

penetration of mobile phones was 0.4%, of which about 71% was pre-paid and 27% contract (post-paid) services. The remaining mobile phones are work-related. This reflects the national distribution between contract and pre-paid mobile phones. According to the participants in the focus groups, the shortage of mobile phones has created a secondary market where SIM card owners sell or rent them at higher prices if they cannot afford to continue the service or want to make some profit.

FIXED TELECOMMUNICATIONS. The e-usage and access household survey found that the average monthly subscriptions and rental charges for fixed telephone lines is Birr 67 (US$8), about 50% of the average revenue per user (ARPU) of Birr 144 (US$16) reported by the incumbent. The median spend on fixed telephone lines is Birr 25 and the median income Birr 600. The median spend represents 4.17% of the GDP per capita adjusted for purchasing power parities (PPP).

Figure 5.7 shows a breakdown of spending on telecommunications services.

The average household expenditure figure of Birr 67 is not entirely surprising as residential (household) phones represent only a marginal part of the incumbent revenues, compared to that from non-governmental organisations and private sector subscribers. The data shows that having at least a primary education was

linked to owning phones. Households with phones tend to have relatively well-educated family members.

The household survey showed that heads of the family and their spouses, who pay for the services, use the household phones. Children are also allowed to use phones when appropriate. This implies that if a phone is available at a household level, four to five people will make use of that phone. The household survey showed that current subscribers are anxious about excessive bills. The majority did not want to apply for additional phone lines, even if the prices dropped. This suggests the ability to pay for additional phones is limited. A 50% decrease in current pricing was considered reasonable by most of the respondents.

Those without phones said that it takes two to four years to get hold of a household phone, and pricing is not their key consideration because they do not have one. This does not only correlate with the ITU figure of a waiting time of 2.7 years in 2003, but also indicates the inability of the incumbent to deliver fixed telephone lines to meet pent-up demand.

The focus group discussions confirmed this and provided further insights into a high degree of interdependence in sharing communication services beyond the household levels. All those who participated in the focus group interviews said that cost of communications is the most important factor in accessing communications services. Focus group participants who do not have access to a fixed phone line said their lack of ownership could be attributed to a number of factors. Key among these is affordability, relevance of a phone compared to other priorities such as food, scarcity of fixed phones and home ownership. Ownership of a house is necessary to secure a fixed telephone line. The tenants of a private property or sub-tenants of Kebele (lower level of administration) houses are not allowed to own a fixed line. However, the rules

Figure 5.6: Communications spend in Ethiopia

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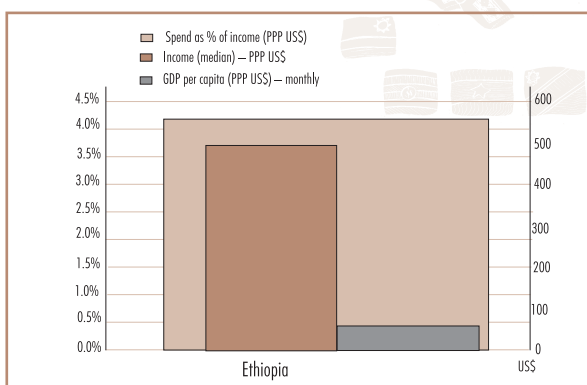
are not observed entirely, and in one suburb a Kebele sub-tenant was able to secure a wireless phone.

The focus group discussions also showed that almost all participants have some access to a fixed telephone through their neighbours or someone close to their houses or through public phones. Their access to neighbours' phones is normally limited to receiving messages or calls. It is not uncommon for persons with fixed private phones to let neighbours use their phones to make calls under special circumstances, for example in the case of accidents or emergencies, in the evening when it may be unsafe to use public phones, or when people do not have the money to make calls from public phones. The level of solidarity and interdependence is breathtaking. A fixed phone is often shared between up to 10 people in a neighbourhood.

However, the relationship between fixed telephone owners and their neighbours is not without problems. Those who do not own fixed phones complain of neighbours failing to inform them when they had messages, or falsely informing the caller that they are not around. They also indicated the inconvenience of communicating using other people's fixed private phones, as it provides little privacy. The groups also talked about being maltreated by owners or other members of the household when they used the phone. This is one of the main reasons to apply for their own fixed private telephone. A 30-year-old man said: "I have a sister who lives in the Gulf States. My mother used to find it very discomforting to talk about personal matters with my sister using a neighbour's telephone. Now that we have our own phone at home, she talks to anyone freely."

The complaint goes both ways. Owners of private fixed phones who let their neighbours have access to receiving calls complained that certain neighbours would talk for long periods (making it difficult for them to use the phone), or get calls during odd hours (late evenings), or they had to make frequent trips (in the case of incessant calls) to the neighbour's place, causing disruption to their day-to-day lives. Landlords are often unwilling to allow their tenants to use the phones for the same reasons. In some cases, the relationship between those who own phones and those who would like to get access to them becomes edgy.

Nevertheless, most people who do not have phones feel grateful that their neighbours call them to receive messages every now and then. Sharing of phones is part of a wider social interaction and interdependence in Ethiopia that goes beyond communications.

Another interesting practice revealed during the focus group discussions was locking the phones, with handsets accessible to receive calls only. Electrical and physical methods are used to lock the phones, but physical methods are widespread. Locking phones is adopted as a major budgeting strategy, since it stops unauthorised users from making calls. The list of unwelcome users includes children, family members who do not pay the bill and neighbours. The person who pays the phone bill is often the one that decides who should have access to the phone key, who should use the phone, and for what purposes.

Locking fixed home phones was often a measure taken after a relatively exorbitant monthly bill. If the bill remains high with more than one key, then the other keys are taken away.

A 40-year-old man said: "My sister and I used to have the keys for the phone. At one time, the bill was very high, and since she had a knack of forgetting to use the key, we agreed I should keep both keys and she could ask for the keys whenever she wants to make a call."

Respondents who own phones say they use their home phones mostly for receiving calls, due to exorbitant bills and the unpredictable billing system.

The ETC requires individuals to come to its pay station at a per-determined time to pay their bills every month. Sometimes customers arrive and are told their bill is not ready, or they are surprised by the amount of the bill. As a result, those who own phones prefer to make calls from public phones, where they can budget and do not have to worry about the bill at the end of the month. Since few complaints about overcharging get resolved, using public phones remains a preferred option to cut costs.

OFFICE PHONES. The quantitative survey showed that only 2.7% of those surveyed had access to telephones at their workplace. The majority of the focus group members do not have access to office phones. It is evident that professionals have more access to phones than rank and file workers, and those employed in public institutions and NGOs have more access than those employed in private institutions.

Employees of NGOs say access to office phones is not restricted if they do not make international calls. In the case of those working for government institutions, there are rules that office calls should not exceed a certain amount. The reported amount varies between Birr 50 (US$5.7) and 250 (US$29). If the bill exceeds the set amount, the excess is deducted from the employee's monthly salary. Some of the mechanisms for reducing phone charges include locking phones to prevent others from making calls, avoiding lengthy or unnecessary calls and sometimes buzzing others so that they call back instead.

Office phones are used to communicate with families or friends about urgent matters; to make distant calls on behalf of family members or friends; or to make calls to mobile phones. In the latter two cases, participants prefer to use office phones to public phones or private phones with the intention of reducing their expenses and retaining some privacy. A few respondents said they have no problem letting friends or family members use their office phones.

The situation is different in the case of private institutions, where there is some kind of cost-sharing practice or phone usage is restricted. Sharing phone bills is a common practice if there is prior agreement. There is also high level of trust among people that they will be able to pay their debts. A 25-year-old businesswoman stated:

"I let my families use my office phone to make international calls. But when the bill comes, they have to pay their part."

On the other hand, some respondents working in big government and non-government institutions do not have access to office phones, except for receiving calls, because they are under the scrutiny of their bosses, who only let them make calls for strictly urgent matters. In the all-women focus group, participants receive calls from their families or relatives on office phones. When they call from their offices, they talk for a relatively longer period than they would have otherwise.

PUBLIC PAYPHONES. Payphones are becoming increasingly popular in Ethiopia, although their number remains small compared to the size of the population. There were 1,813 public payphones in September 2004. The majority of the customers use kiosk phones to make phone calls. Use of public payphones is the highest (21%), followed by private kiosks (17.3%) and telecentres (16.7%). About 0.2% of those surveyed indicated that they had access to cheaper phone rates through VoIP when making international calls. Although VoIP is illegal, there is a significant underground international long -distance market. The number of users of VoIP has grown dramatically, as it cuts international communication costs by a factor of four to five.

Most people walk for 30 to 60 minutes to get to public payphones, although this is changing with the
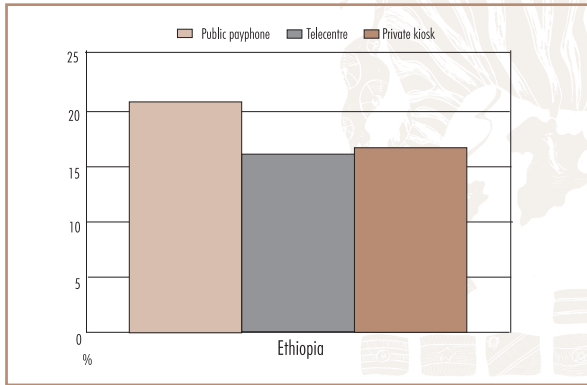
Figure 5.7: Private, telecentre and public telephone usage in last three months

introduction of more public payphones throughout the country. The median time to reach public payphones is 60 minutes and kiosk phones 45 minutes, an indication of the scarcity of public payphones compared to kiosk phones.

Rural people walk for over two hours to get to public phones. Most of these travel long distances (often over 15km) to make their calls. Private kiosks are regarded as expensive but more convenient than public payphones or telecentres. Private phones are often closer to customers. The median time to reach private kiosks is 45 minutes. Moreover, those who use private kiosk phones provide added features such as taking messages, facilitating incoming calls or "beeping".

The survey asked participants why they use public phones ahead of private kiosks and telecentres. Value for money was regarded as an important consideration when making phone calls in Ethiopia – 66% of those who use public and community phones said value for money is the most important factor, followed by 24% who consider proximity a necessity. Those who had access to VoIP indicated that they walk or take public transport for over two hours to get to where they make those international calls.

The average spend on public kiosks is Birr 5.50, a reasonable amount when one considers the number of

people calling their families abroad or in one of the outer regions.

Focus group discussions showed that individuals' choice of public phones is dictated by cost considerations, distance and privacy. Perhaps due to concerns of safety of facilities or proximity to the majority of people, public payphones are installed near public institutions, or along main roads. They are rarely in residential areas. However, there are a number of kiosk phones and a few telecentres in neighbourhoods, which makes these relatively accessible compared to public payphones. Hence, individuals who make urgent calls, or who are loath to travel, prefer other privately-owned public phones over public payphones. As distance between public payphones and the caller increases, private telecentres or kiosk phones remain the only options to make calls.

Call boxes, which were recently installed by ETC and have their own call rooms/boxes, were identified by most participants as being more secure and private.

In instances when people cannot or do not want to use the ETC's call box booths (due to distance or long queues), and when there is a need for privacy, they opt to use a kiosk or a telecentre further from their homes where they can be more anonymous.

Figure 5.8: Main reason why a public phone is used more than others
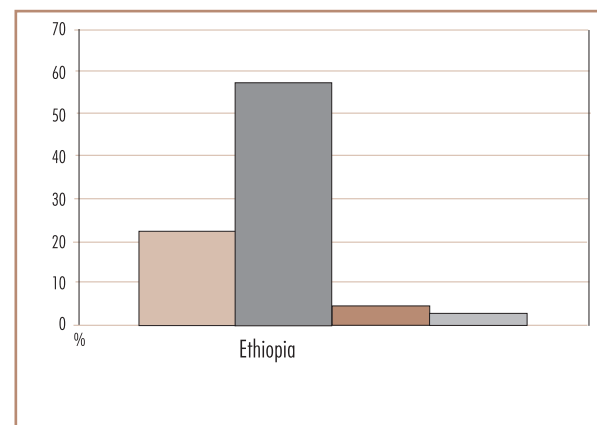
In general, call boxes or telecentres are often preferred to kiosk phones, especially when making long-distance calls. Kiosks are the most expensive of all public phone systems, often three to four times that of ETC coin boxes or twice that of telecentres. Telecentres are operated by those who are licensed to provide communication services at a profit. Most telecentres are equipped with two to four lines and some offer Internet and secretarial services. Kiosks normally use a single telephone line and do not have licenses to provide communication services.

Discussants report that women are also often easy targets for taunts or complaints about the time they spend on public payphones. There is a tacit expectation that when other people are waiting, one should not use the phone for more than a certain period (three minutes). This is normally the case during the daytime, when public payphones are busy with long queues. In reality, there is a high degree of helpfulness among public payphone users. Those in the queue are glad to help their fellows with extra coins or give information on the status of the payphone. The introduction of phone cards seems to have reduced the interaction. Callers can now buy airtime from the new breed of "public phone assistants" that operate from public payphone booths.

MOBILE TELEPHONY. Mobile access is scarce in Ethiopia. Those who have access to mobile phones say they own one handset and a single SIM card. 95% of those who indicated mobile ownership have said they have only one SIM card. It is a luxury to own more than one SIM card in Ethiopia. Mobile teledensity stands at a dismally low 0.22% and is mainly concentrated in the major towns. The survey indicated a slightly higher penetration rate of 0.3%, of which 71% had pre-paid subscriptions, 27% contract subscriptions and the remaining having subscriptions at their workplaces. However, the number of post-paid subscribers is

relatively higher than many countries in Africa because pre-paid subscription was only introduced in 2003 and is relatively new in Ethiopia. Originally, only contract subscriptions were allowed. However, the proportion of pre-paid services is expected to increase.

The ARPU for pre-paid users is Birr 70 (US$8) while that of contract cellular subscribers is Birr 216 (US$25). The average revenue of both pre-paid and contract cellphones is Birr 143 (US$16). This is in line with the ARPU of Birr 135 (US$15) reported by the incumbent in 2004.

The household survey found that the nature of employment has a significant impact on mobile ownership. A third of those who reported mobile ownership were fully employed by a non-family member. Another one-third was self-employed all year. 8.5% were students, 5.1% were housewives and another 5.1% were unemployed. The most common occupation of those who owned mobile phones was formal and informal trading. A further breakdown of employment shows that 30.4% were employed in private service sector, while 21.4 were working as civil servants in government offices.

Those working for NGOs represented 5.4%, an indication that a substantial number of individuals that own mobile phones are employed by international organisations. This is consistent with overall

Figure 5.9: Age distribution of mobile ownership
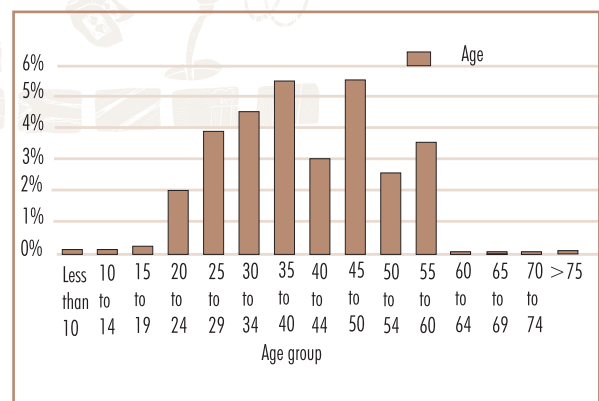
employment patterns in Addis Ababa. The city hosts the African Union, the Economic Commission for Africa, over a hundred embassies, a number of NGOs and international organisations. Individuals working in these organisations often represent the high-income middle-class strata that can afford to access communication services (i.e. mobile, fixed and Internet).

The frequency of use also increases with the level of education. Those who reported mobile ownership have either secondary and tertiary education; the higher the education, the better the ownership facts. 52% of those who have cellphones have college education. Cellphone distribution also tallies with income patterns and age: it is high for those between 21-54 years, and ownership of a pre-paid service begins at the age of 16.

The household survey showed significant gender gaps in the use of mobile phones and email that can be attributed to the economic and educational status of women. Three-quarters of mobile users are men, as are 70% of those with access to email. This does not only indicate historical discrimination against women but also business and livelihood-related issues, which tend to further reflect gender inequalities. Men are the bread-winners who have more employment opportunities.

Household heads or their spouses own 75% of mobiles, while the rest belong to older children. Married people tend to own more mobile phones than singles,

Figure 5.10: Gender disaggregation of mobile phone ownership
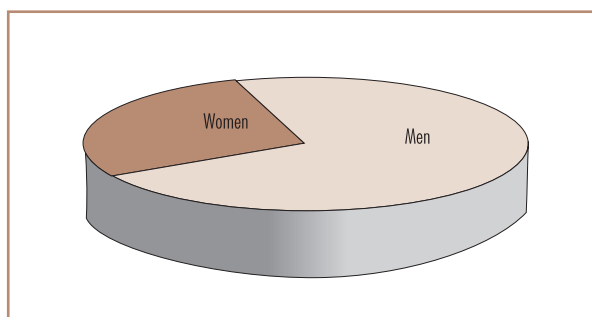
although this may change as availability of pre-paid cellphones improves. Of those who reported access to mobile phones, 40% were single and 60% married. This is in contrast to the national statistics, where there is only a slight difference between the number of married and single people (48% married and 43% single). Married people also own more contract phones.

Given the scarcity of mobile phones, 40% of mobile owners said they are using them optimally. About 54% said that they are cost-conscious when using their mobile phones, particularly when making calls to fixed phones.

The focus group discussions provided interesting insights as to how users cope with the scarcity of mobile phones. The high cost of the handsets and high subscription fees relative to the income of the majority of the population makes mobile phones very expensive. However, cellular users have been ingenious in working around affordability challenges. The scarcity has created an innovative secondary market of SIM card rentals and used handsets.

Most of the focus groups participants who use mobile phones indicated that friends or relatives at home or abroad have covered subscription charges totally or partially, including the cost of handsets. The diaspora is the main source of handsets. In other cases, the money to buy handsets and the service is sent home. Mobile handsets are generally received as a gift by most women. Respondents also said that as far as they can tell, at least half of them have received partial or total support to secure the mobile phones.

For the majority of the population, initial handset costs and subscription fees are regarded as the major deterrent to mobile ownership. Those who do not own mobile phones also attributed their non-ownership status to the relative lack of importance of mobile phones compared to other urgent needs and priorities,

and a long waiting list and bureaucratic hassles to secure a cellular service. Those who own fixed phones and stay at home said they do not see the immediate need for a mobile service. A 45-year-old woman said: "I don't need a mobile (phone) because I am a housewife, and I can be reached through the home phone."

Access to mobile services in Ethiopia is characterised by bureaucratic hassles and a long waiting list comprising hundreds of thousands of people. This is a major hindrance to adopting the technology, particularly by those who can afford to have mobiles but have not been able to do so. Some people who get phones often sell their rights at a profit. Registered users who cannot afford the service sell their rights through a guarantor to someone who is willing to cover both the expense of the SIM card and also pay a certain amount of fee for the right. The reported amounts range from Birr 750 to over Birr 1,000 (US$100 to $120). The reported amounts are higher in Dire Dawa, where mobile services are scarce compared to Addis Ababa. There are those who offer a use right for a certain period (extending for months) to cover the initial cost of obtaining the SIM card.

While selling SIM card rights is common in both Dire Dawa and Addis Ababa, renting SIM cards appears to be commonplace only in Addis Ababa. Individuals rent their SIM cards if they are financially constrained to use them themselves or if they think they can do without them. The rate for renting SIMs has undergone a drastic decline, and the common rate in Addis Ababa is Birr 50 per month. Some Ethiopians from the diaspora and foreigners are reported to have paid twice that amount, or more, to rent SIM cards for a short period because it is not possible to get them readily.

Although not widespread, there is also the practice of owning more than one SIM card. The reasons include the need to use different numbers, or as a means of generating income. One respondent claimed to have a friend with three SIM cards who rents out two of them, and uses the income to cover the cost of the third. This is an example of how the scarcity of mobile phones in Ethiopia has created a vibrant secondary market.

Another common practice in Addis Ababa is for individuals who have just acquired their SIM cards to keep the card for a while instead of using it, mainly because they are unable to buy the handset, or want to make optimum use of the air time that is included as part of the subscription. A popular reference to such SIM cards is "Soft net" in reference to the way they are often kept, which is being wrapped in soft paper.

However, a recent decline in the cost of handsets due to availability of second-hand handsets has improved the penetration of mobile phones throughout the country. Low income and first-time users often opt for second-hand handsets. It was also mentioned in the focus group discussions that family members exchange handsets when they buy new ones.

Even when the initial costs of getting a SIM and a handset are resolved, most people have difficulty in meeting the minimum expenses required to keep the SIM card active, reportedly Birr50 (US$7) a month. Some participants are aware of individuals whose mobiles' become inactive because they could not afford to cover the periodic expenses.

According to one teacher: "I had to save, and minimise my other expenses, such as hanging out with friends, and walking on foot instead of using other means of transport. I still maintain this habit since I find covering the expense of top-up a challenge."

Mobile "beeping", or buzzing, is a popular practice in Ethiopia. Buzzing, or "miscall", as it is popularly called in Ethiopia, is the practice of dialling another user's mobile phone and letting it ring but hanging up
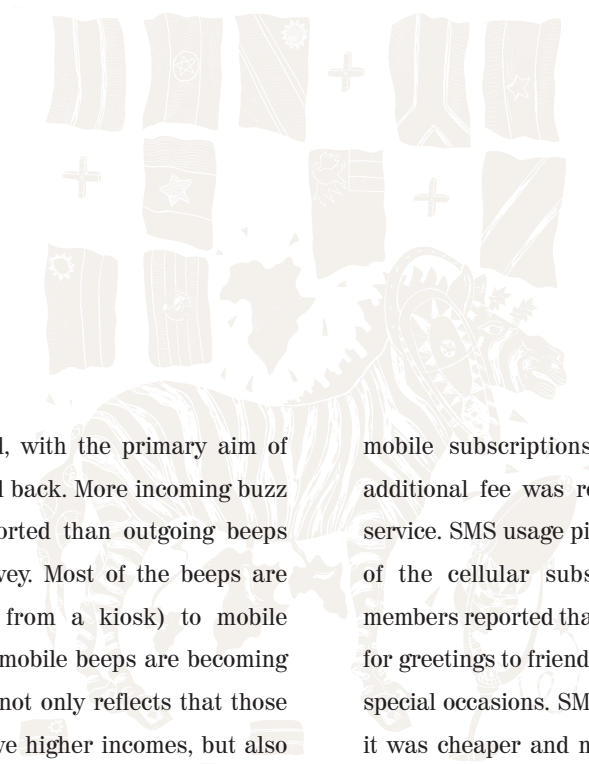
before the call is answered, with the primary aim of prompting the person to call back. More incoming buzz to mobile phones was reported than outgoing beeps through the household survey. Most of the beeps are from fixed phones (often from a kiosk) to mobile phones, although mobile-to-mobile beeps are becoming increasingly common. This not only reflects that those who own mobile phones have higher incomes, but also indicate that "beeping" makes it easier for those without phones to get in touch with family and friends. The success of "miscall" suggests the majority of calls are returned.

From the focus group discussions, it was apparent that there is a pattern to the kind of relationship between those who buzz and are buzzed, which also determines to a great extent its success. Those who buzz said that they often buzz friends or family members (particularly to those who are financially better off), and to persons with whom there is an understanding that they wanted to be communicated with. Mobile users say they often respond to buzzing people they know, and may not do so otherwise. People buzz to mobile users from all types of phones, except for the public payphones that do not accept return calls.

All the same, buzzing is preferred to making a proper call to avoid expenses, or when mobile users run out of airtime. Communicating through buzzing has also been reported among close friends, whereby a message is communicated to the receiver depending on the number of rings: buzzing only once is meant to say hi, and buzzing more than once means it is something important and they should call back.

One young man said: "Buzzing my girlfriend twice is my way of telling her that I am home."

The household survey and focus group discussion reported usage of SMS before it was closed down in June 2005. Originally SMS was not part of the package of mobile subscriptions. A separate arrangement and additional fee was required to subscribe to the SMS service. SMS usage picked up as soon as it became part of the cellular subscription package. Focus group members reported that the most popular use of SMS was for greetings to friends and families during holidays and special occasions. SMS was preferable to voice because it was cheaper and more convenient. People also used SMS to send jokes and pictures, and to communicate urgent and personal matters from public places.

There was extensive use of SMS during the campaign for the 2005 elections. SMS was used as a channel by members of both the ruling and opposition parties and supporters to step up their election campaigns. During the unrest after the elections, SMS was used as popular means for sharing information among friends and relatives living in different parts of the country about developments in their respective areas. Some of the messages included calls for demonstrations, and boycotting certain acts. According to one participant: "I participated in a demonstration because I was moved by the text messages I used to receive on my mobile phone."

It was also during this period that the use and benefits of SMS was most recognised among mobile users. One Internet café was registering customers to provide job vacancy notification services through SMS for Birr 20. Such and other optimistic plans regarding SMS were shortlived, as the ETC stopped providing the service, citing expansion-related problems.

INTERNET. Although access to fixed and mobile lines represents a key step in Ethiopia's ICT development, there has been a realisation that access to the Internet is fundamental in achieving development goals. However, in contrast to widespread use of phones, the survey showed a very low household Internet penetration of 0.14%.

Access to the Internet is partly hampered by lack of computers at household levels but is also due to limited telephone penetration. Only 2.2% of those surveyed said that a member of the household had access to computers. The principal point of access of the Internet was the workplace, followed by cyber cafés. Of those who indicated Internet connections, 55% said that they had access at their workplace, while 22% were able to access to the Internet through cyber cafés. Internet subscribers revealed that their average spend on the Internet is Birr 222 (US$26) per month, with a minimum of Birr 50 and maximum of Birr 500 (US$58). This was in line with the national average expenditure of Birr 204 (US$25) reported by the ETC.

In addition to a gender bias towards men, there are more single email users than married people. This suggests that young people use the Internet the most. Over 60% of those who indicated that they have access to email were between 21-29. There is a virtual absence of children under 15 from the data. Apart from the historical economic and social discrimination against them, women are less likely to travel to cyber cafés crowded with men to access email. However, the situation is beginning to change as more women begin to discover the Internet and manage cyber cafés. Cyber cafés tend to be managed more by women than men; an incentive for more women to get access to the Internet.

Level of education was found to be one of the key factors that influences use of the Internet. Tertiary education was found to be instrumental for exposure to the Internet and to the income possibilities. 80% of those with access to email have college education. This has an indirect implication for gender differences, as more men tend to attend college than women.

Over a third (35.8%) who access email are employed in the private sector while 21.4% are civil servants.

College students form a large part of those with access to email. About a third (31%) attend school.

Focus group discussions confirmed similar patterns and challenges in the use of the Internet. It was evident from the discussions that email and web browsing were not the most-used services. Most participants, especially in Dire Dawa, understood the term Internet to mean Internet telephony – proof of the popularity of Internet telephony or services that bypass the incumbent's services, although these remain illegal. The popularity of VoIP to make international calls was attributed to the huge price difference between that of the incumbent and underground VoIP resellers.

To make a call, ETC asks people to pay Birr 50 or 100 in advance and charges about Birr 11.5 (US$1.25) a minute, while the grey market charges between Birr 3 and 4 (US$0.3–0.4). Students and professionals reported to have browsed the Internet in search of information on a range of issues of relevance, and scholarships for further education abroad.

Focus group participants with email addresses use the Internet to send messages to friends and relatives living abroad. They learned how to use email through friends.

Interestingly, those who graduated from university do not usually access the Internet. Responding to a question why he does not have an email address, a professional said: "It is a new technology. It has never occurred to me that I should have my own email address, for none of the people I know ever asked me for or gave me an email address. People are more interested in phone numbers."

CYBER CAFÉS. Although the number is increasing, Internet cafés are a recent phenomenon in Ethiopia. Only 0.1% of those surveyed indicated that they used cyber cafés less than once a week. 36.2% said they visited once a week, while a quarter said they visit cyber cafés more than five times a week for sending and

receiving email and browsing the web. Most cyber café users said their pattern of use did not change over the last six months. This is not entirely surprising, as there has been little change in pricing and quality of service.

Around 60% of those who visit cyber cafés said that they use cafés based on convenience and have no preference for a particular cyber café. The average expense on cyber cafés was Birr 16 (US$2) per week. This translates to usage of about an hour per week.

Focus group participants indicated that they spend between Birr 2 and 10 at a time. They use different strategies to reduce their expenses on the Internet. These include writing messages before getting onto the Internet, asking someone to help them to compose the message and visiting the Internet cafes that give discounts for using the service beyond a certain period.

CONCLUSION

It can be concluded from the this study that fixed and mobile phone lines are scarce, but there is an increasing use of public access points such as private kiosks, telecentres and public phones in Ethiopia. The survey also indicated a relatively high usage of public telephones, even when the distance is far. The cost of communications is high and per capita income is low; which points to the fact that the demand for mobile and fixed phones is far greater than historically anticipated by policy-makers and the incumbent telecommunications operator. The survey further revealed that efforts and policies to increase telephone penetration have not been successful in making a dent in this universal access problem.

It was also found that post is not the most common means of communication in Ethiopia. Postal services are not adequately diffused throughout the country. Besides being slow, mail often gets lost. As a result, public access points remained the major form of communication. People in rural areas tend to make longer intra-district, national and international phone calls than sending mail. Many Ethiopians work abroad, particularly in Gulf States. ICTs are the most important tool for organising transfer of remittances. Families call relatives abroad (mainly children) to send money home; relatives call when the remittance is sent. This suggests the importance of universal service strategies that promote community access points. Universal service targets and telephone expansion plans should be based on knowledge of these actual patterns of usage of communication services.

The focus group discussions were particularly important in bringing out valuable insights about the actual use of different communications technologies by groups and individuals and problems that users face in adopting and using communications technologies in Ethiopia. Four major conclusions that have implications to policy-making can be drawn from the e-usage study:

SCARCITY OF COMMUNICATIONS. Despite increases in telecommunications investment and a recent rollout of communications services (fixed, mobile and the Internet), there is still a huge gap between supply of communications services and demand in Ethiopia. The incumbent has been unable to reduce the waiting list of fixed communication services. Mobile services are in high demand in cities like Dire Dawa, giving rise to a secondary market of SIM card rentals. The household survey showed a significant potential for widespread use of mobile phones by those who are employed in the informal sector. Current projections for increasing penetration from 0.22% to 1.5% are indeed very low. A 5-10% penetration would be more appropriate.

Although Internet bandwidth has improved recently with the introduction of a multimedia network, the majority of the population is unaware of the value of the Internet and does not have the necessary capacity to use it. Internet penetration is very low, due to many factors, including low awareness regarding the value of

the service, low levels of computer literacy, and a lack of commitment to expand the service beyond major towns. Knowledge of how to use the Internet services is a significant driver of its demand. Where available, Internet was concentrated in high-income, well-educated parts of society and has not had a substantial impact on the majority of Ethiopians.

It is critical that policy-makers and the regulator monitor the quality of service and the tariff to respond to user requirements. Stimulating demand in schools and at the workplace would also increase Internet penetration. A course in IT has been recently made an integral component of secondary school education, which will contribute to the increase in the popularity of the Internet and a rise in the number of its users. Promoting community/public Internet access would increase its value to the society. Access to the Internet needs to be matched with availability of the necessary content and competence to make use of the technologies for personal, organisational and community advancement. Making technologies accessible is one challenge; increasing usage is more daunting.
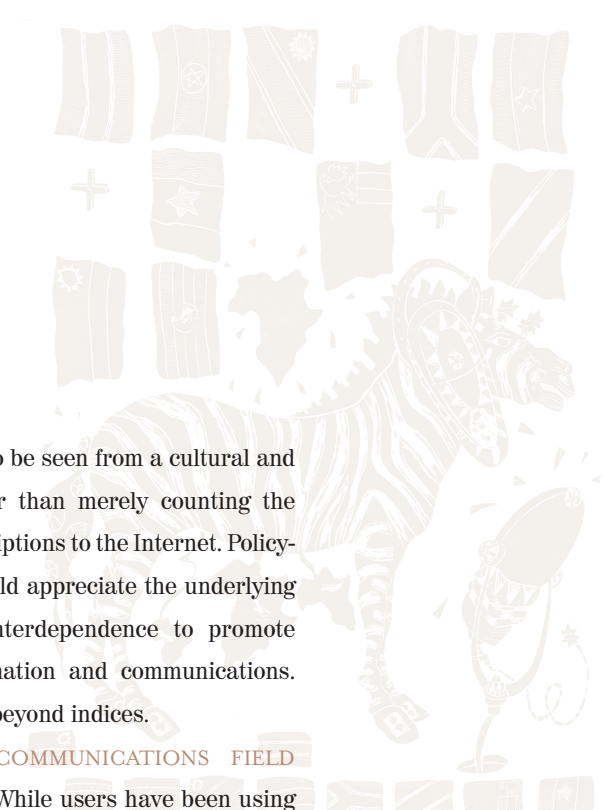
The significant gender gap in accessing communication services in Ethiopia is disconcerting, but should be bridged with growing availability of pre-paid mobile phones and public access points that are run by women. There has been a significant increase in the number of women operating telecentres, following the liberalisation of public call services in 2003. This is expected to improve women's access to communication services. As more women continue to manage cyber cafés, access to these by women is expected to improve.

COSTS OF COMMUNICATION ARE HIGH FOR THE MAJORITY OF ETHIOPIANS. The key finding of the focus group discussions was that there has been limited attention paid to the affordability of communication services for the majority of Ethiopians. While efforts by the incumbent operator to expand its services are commendable, especially to meet the growing demand for communication services, a parallel effort should be made to increase usage of the services by those who need communications the most. Adequate penetration of mobile phones, fixed lines and Internet and a reduction in the gender gap cannot be achieved unless communications become cheaply and widely available throughout the country. Government needs to take proactive steps to promote competition, increase public access and reduce prices of communication services so as to improve access to those who need it the most.

As shown above, those who cannot afford the cost of communications have already resorted to using public phones to make calls and use their mobile and fixed phones to receive calls. Technologies such as VoIP are becoming common and new wireless technologies will continue to create opportunities for users to get around regulations and the monopoly market structure. Communications users will continue to invent new strategies to cope with higher communication costs. Since this will continue to erode the lucrative market share of the incumbent, it is therefore in the interest of the government and the incumbent to take affordability issues seriously and work towards promoting incentives that increase usage.

COMMUNICATION HAS BECOME A SIGNIFICANT COMPONENT OF SOCIAL CAPITAL, INTERDEPENDENCE AND INTERACTION. The focus group discussion revealed a high degree of sharing and interdependence among people in making use of communication services in Ethiopia. Fixed phones are shared among neighbours; friends take messages at offices and make calls on behalf of friends or family members. The majority of mobile handsets are acquired as gifts from family or friends at home and abroad. Cyber cafés are main spots for socialisation. This indicates that access to

communications should also be seen from a cultural and social point of view rather than merely counting the number of phones or subscriptions to the Internet. Policymakers and operators should appreciate the underlying culture of sharing and interdependence to promote universal access to information and communications. Researchers need to move beyond indices.

INNOVATION IN THE COMMUNICATIONS FIELD SHOULD BE UNLEASHED. While users have been using various strategies to reduce their expenditure on communications, there have been limited initiatives on the part of the government to promote innovations and spin-offs in the communications sector due to the monopoly market structure. For example, the popularity that was gained by SMS and innovative spin-offs, such as advertising, were curtailed due to the suspension of the SMS service in June 2005. Innovations around wireless technologies are virtually absent in Ethiopia. The high demand for mobile telephones, and the low popularity and penetration of the Internet, can best be met by the involvement of the private sector, which would speed up the provision of the services in the major cities and contribute to innovations and the expansion of these services in uncharted geographical areas. ❏

ENDNOTES

For convenience, the Ethiopian Fiscal year was used. The Ethiopian year ends on September 10. For example, figures of year 2003 represent the status at September 10, 2003.