# Universal Access and Rural Communication Development Funds: Success factors world-wide & practical insights from Uganda

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***Abstract***

The universal access fund (UAF), or rural communications development fund, is becoming the most widely accepted mechanism for mobilising private sector investment into challenging rural areas, within a liberalising environment. The funds, which typically offer once-only start-up subsidies for designated areas, have mainly focused on creating and supporting telephone service licenses, starting with village payphones. Some now support Internet access and advanced ICT projects. The UAF model is just beginning in Africa and many believe that these funds hold great promise for the future. However now, not later, is the time to look at world experience to date, as there are pitfalls to avoid, to see how this applies to African countries. In view of the urgency of bridging the digital divide, Africa cannot afford to invest time and energy into creating funds and see them fail. But they will *not* work unless the overall policy and regulatory regime are complementary to the 'smart subsidy' objective of the UAF. Key principles are explained in this article. As well, from direct experience of funds in Uganda, Peru and Nepal, and from close study of all the Latin American examples, the authors offer lessons and pointers to assist regulators to understand the issues and create successful UAF models.

## *Introduction*

Three central messages are provided in this paper: Two are instructive lessons coming from those countries that have set up or are trying to set up rural communications funds. The third illustrates the creative ability of a competitive market to reach rural areas and is very good news that regulators should make use of. The messages are these:

1. *Funding is only part of the requirement for rural telecom networks to develop. Don't expect rural communications funds to be a panacea for rural service roll-out* unless private sector players are offered real incentives in addition to subsidies – such as attractive licenses, a level playing field and fair interconnection terms. These affect long-term sustainability. Good supporting regulation is key to the efficient use of subsidy to leverage private investment and to getting high quality self-sustaining service in place.
2. *Advanced ICT development in rural areas is very challenging and will not be solved by throwing lots of money at fundamentally unsustainable concepts.* Governments need to show ICT policy leadership and create demand for the use of ICTs outside of the UA arena, while UAFs should focus mainly on supporting Internet access and business models that emphasise small-scale businesses that have a chance of mass replication.
3. *The reach of the mobile revolution into rural areas is illustrating that liberalisation and good regulation can have a major impact on the market and that many areas are less in need of subsidies than previously thought.* Up to a certain point (which varies in each country) mobile operators are achieving what regulators have been trying to achieve for many years – and they are doing it voluntarily, out of their own market responsiveness and commercial interest in a competitive environment. This is making regulators' tasks easier in some respects and providing some important lessons.

Each of these messages will be dealt with in a separate section, with conclusions for discussion and further action. However, first of all we provide:

- An understanding of market gaps and the digital divide which is foundational to achieving success in the rural arena; and
- A basic definition of universal access and description of the UAF process

## *Two access gaps: market efficiency gap and the true access gap*

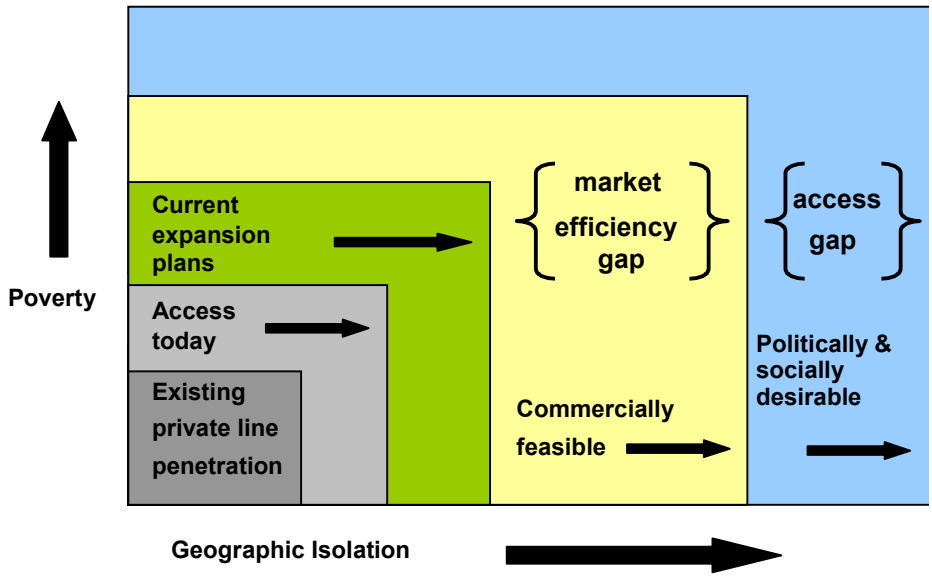
When talking about the challenge of reaching the whole populace with communications services, it is often referred to collectively, without distinction, as 'the access gap'. However, we can identify two separate 'gaps' which must be understood and addressed differently. We refer to these gaps as the *market efficiency gap*, and the true *access gap*[1].

There are also two dimensions to the challenge of achieving universal reach, both of which need policy makers' attention: these are poverty and isolation. Poverty of course exists in both urban and rural areas, however the cost of addressing both poverty and isolation together, as exists in many rural settings, is much higher. Providing access to the urban poor can be done through policies and innovative measures that are well within the reach of the market, often without much special finance. The main requirement is to allow entrepreneurs who wish to re-sell and retail services to people who cannot afford their own private communications facilities to be free to do so.

On the other hand, reaching some poor *rural* areas may be well beyond the reach of the market. The following diagram illustrates the concept of how we can determine the limitations of the market place. The two axes illustrate the two critical dimensions – relative poverty and geographic isolation.

Looking first at customer penetration (bottom left hand corner of the diagram), in most low-income countries the current telecommunications network reaches only a small percentage of population and geographical area.

[1] The conceptual framework of the two gaps is developed in the World Bank Discussion Paper No. 432, *Telecommunications & Information Services for the Poor: Toward a Strategy for Universal Access*, Juan Navas-Sabater, Andrew Dymond, Niina Juntunen.




*Intelecon Universal Access market model*

However real access, even today, goes well beyond the limits of private residential penetration, to the second frontier. Payphones are traditionally the main means for those without a phone to access the network. Many private phones, including mobiles, are also shared, or access time is re-sold by businessmen, government officials, teachers or other individuals allowing others to make and pay for calls. This all adds up to a much broader access than pure 'teledensity' implies.

A further access frontier (the third line) will be reached when the build-out plans or obligatory targets of existing operators are reached. However, examples around the world show that obligations are often only slowly and unwillingly fulfilled (if at all) and do not incentivise operators to perform well in providing service. This is especially the case for incumbent operators not yet privatised and retaining their monopoly. The situation is compounded further if policies and regulations discourage operators or new entrants from reaching or exceeding the obligations, e.g. insistence on maintaining inflexible low tariffs that don't allow operators to at least recover costs from obligation payphones. The plans and targets of fixed operators often leave a huge gap between planned reach and what might be feasible.

There is also still the perception that rural areas are loss-making, whereas there is often *much more* affordability than many believe to exist. For example, the large demand for urbanised people to call their relatives and friends back in the village (i.e. the incoming call market) – amounting to several times the revenue generating capacity of the rural areas themselves – is largely ignored by conventional telecom economics.

***The market efficiency gap,*** then, is the difference between what markets are actually achieving under current conditions, and what they could achieve if regulatory barriers were removed and regulation is used to provide incentives. This gap can be bridged through more private provision of service facilitated by effective competition and by market-oriented policies and regulations that create a level playing field for new entrants. The only question relates to exactly what the market's limits are (i.e. how far could be reached commercially), and how best to implement and sequence more competitive conditions. Effective market-oriented regulation sets the stage and creates the environment for operators to be able to serve a much broader area and populace and thus close the market efficiency gap. This frontier can be reached *without subsidies.*

***The access gap*** – recognises that intervention is still required to reach some areas and population groups that will not be served even with the most attractive, liberal market conditions. There are people and places that remain beyond the limits of the market unless additional investments are mobilised through intervention, in the form of subsidies or other special incentives to encourage service providers to enter. The UAF is a mechanism focused on the true access gap – i.e. extending the market into marginal areas.

### *What is a Universal Access Fund (UAF)?*

Universal Access (UA) is the policy objective to provide convenient and affordable communications access, on a community basis, through public access facilities such as payphones and telecentres to the whole population[2]. UA may be defined as placing a publicly accessible telephone in every population centre above a certain population size, or placing public phones such as to guarantee that anyone, no mater where they live, need not walk more than a certain distance – e.g. 5 km - to reach a phone.

For the reason previously explained, that bridging the poverty and isolation gaps together is costly, UAFs usually focus on rural network access and are thus often called, as in Uganda's case, the "Rural Development Communications Fund", or something similar.

The UAF is a tool, used mostly within a liberalised market, for reaching beyond the limitations of the market. UAFs are usually managed by an entity that is independent of both government and operators. In the majority of cases they are under the auspices of the regulator, though with a separate manager, board of trustees, bank account and reporting procedure.

UAFs are a means for the communications sector to meet the challenge of achieving universal access (UA) and country-wide market development from its own resources, and equitably. In most UAF examples to date, money is channelled from license fees, spectrum charges or a special levy (e.g. 1%) on the revenues of all operators and is set aside to assist those operators willing to serve high cost, challenging rural areas. Thus the UAF, in net effect, re-distributes a small amount of finance from those who would rather not be saddled with the responsibility of serving difficult areas to those willing and eager to do so. Applying the funds to those operators with good motivation and willingness to leverage further investment is a key advantage of the UAF model. The rural market is then developed by those who want to do so, to the benefit of all. This is a 'win-win-win', since all operators benefit from long-term market growth by paying rather a small amount, those wanting to serve rural areas get an opportunity to receive financial help, and customers benefit from the additional network coverage.

The competitive mechanism for distributing UAF subsidies is usually a 'reverse auction'. The Fund administration studies and estimates the maximum subsidy required to allow an operator to serve a designated area or group of communities, and sets this out as the subsidy available to the winning bidder. Applicants are then invited to bid for a license to serve the designated areas, and the license is awarded to the bidder requiring the lowest subsidy, subject to that operator passing a pre-qualification process to ensure that bidders meet minimum technical and corporate criteria and are capable of providing the required services.

Each country has a different standard as to who should contribute to the UAF, whether just fixed operators, fixed and mobile, ISPs, or even the postal sector. In principle all those likely to benefit from the activities of the Fund should contribute equally in proportion to their revenues. In Uganda, all such communications businesses contribute 1% of their revenues and the Fund in turn addresses itself to supporting not just telephony, but all kinds of ICT and document delivery services into rural areas.

The concept is one of 'smart subsidy' or 'smart incentive'. Long term sustainability of the service is the objective, and the subsidy is given only once. It is recognised that a financial enticement is required to invest in difficult areas, but the once-only subsidy is offered to meet whatever capital and operating shortfall is required to carry the investment from loss-making to the point of viability and acceptable rate of return. The operator is expected to meet the roll-out obligations spelled out in the bidding documents and in the license, to provide a stipulated quality of service and to develop the business in a self-sustaining manner, free of further subsidies. The operator is usually not granted exclusivity, only the benefit of being 'first in' to a territory which is unlikely to attract other entrants for the foreseeable future.

[2] UA is the forerunner to Universal Service (US), which is the objective of making facilities available individually, to every household. This is mostly the policy objective in OECD countries. Usually it is more practical for developing countries to aim at Universal Access in the near-to-medium term while regarding Universal Service as the long-term objective.

### *The experience with funds: Success factors and pitfalls to avoid*

Since the first developing country fund was established in the mid-1990's, approximately 20,000 communities have received telephone service through UAF mechanisms in five countries. More than ten rural operators have been licensed, with subsidies given as summarised in the following table. Several other Latin American countries are planning UAFs. In Asia, only Nepal has any experience to date and this is very limited, while Uganda's will be the first experience of a broad-based fund with open bidding in Africa.

| Country | Name | Source of Finance | Period | Localities served | Max. subsidy available (US$m) | Subsidy granted (US$m) | Subsidy per locality (US$) |
|---|---|---|---|---|---|---|---|
| Chile | Fondo de Desarrollo de las Telecomunicaciones | Government budget | 1995-97 | 4,504 | 24.2 | 10.2 | 2,256 |
| | | | 1998-99 | 1,412 | 14.4 | 9.8 | 6,919 |
| | | | 2000 | 143 | 1.9 | 1.8 | 12,727 |
| Peru | Fondo de Inversión en Telecomunicaciones (FITEL) | 1% Operator levy | 1998 | 213 | 4.0 | 1.7 | 18,800 |
| | | | 1999 | 1.937 | 50.0 | 11.0 | 5,700 |
| | | | 2000 | 2,290 | 59.5 | 27.8 | 12,100 |
| Colombia | Fondo de Comunicaciones (Compartel) | Operator levy & Government contribution | 1999 | 6,865 | 70.6 | 31.8 | 4,600 |
| Guatemala | Fondo para el Desarrollo de la Telefonía (FONDETEL) | Spectrum auctions | 1998 | 202 | N/A | 1.5 | 7,587 |
| | | | 1999 (2) | 1,051 | N/A | 4.5 | 4,282 |
| Dominican Rep. | Fondo de Desarrollo de las Telecomunicaciones (FDT) | 2% Operator levy | 2001 | 500 | 3.8 | 3.4 | 6,800 |

The table shows that various sources are used for Fund finance, including direct Government contribution, a levy on operators, or radio license fees. *In most cases the amount of subsidy actually bid and granted was much less than the maximum offered by the funds. Also, the Funds have all leveraged much more private sector investment than the subsidies given. For example, in Chile that ratio was overall approximately 20:1.* However, the table averages hide a wide range of experiences, from zero subsidies in some of the early Chilean competitions to 100% of the offered amount in later rounds.

An important lesson is that the successes appear to be due to a combination of careful fund design and supportive regulation. On the other hand, all potential problem areas could not be anticipated or fully addressed in advance. Some of the challenges have arisen largely due to international market factors and issues or failures encountered by licensees that, while beyond the control of governments and regulators, must also be taken into account by regulators and Fund designers.

Most of the Funds have achieved the access targets set by Government. The key lessons are the following:

- ***The fund and licence design needs to take into account the strategic interests of potential bidders –*** Competition between incumbents wishing to secure territory and new entrants wishing to gain a foothold in the market place have made the funds a success in the majority of cases. The first one or two rounds in each country were the most hotly contested because they involved strategic interests of the bidders. The Funds were able to maximise interest and minimise subsidies through designing licences that were flexible enough to suit new entrants' and incumbents' strategic interests alike, i.e. they divided the territory in several licenses and allowed operators to choose and select according to their interests. Operators were allowed to bid for single licences close to their existing coverage as well as multiple licences assembling territorial blocks. It is also important to design licence areas approx. equally attractive so none is left without a bid (i.e. don't group only the least viable communities together).

In Uganda's RCDF auction, only 154 sub-counties in certain parts of the country – those unserved by the two main operators, Uganda Telecom and MTN – will be offered for competitive bid. The licenses will be offered in up to eight small regional blocks. Operators will be given the option of bidding for any number. It is expected that whereas mobile operators will bid selectively, fixed VSAT based operators may seek to increase their economy of scale by bidding competitively for all of them together.

- ***Bidders respond to competition if there is something attractive on offer*** – Bidders for many of the rural payphone licenses have been allowed to also serve other business and residential customers and to propose unregulated services that were added to their licenses and contribute to commercial viability. One wireless operator in Chile that won licenses requiring 1,800 payphones has built an extensive regional network with 18,000 lines. Also bidders get access to frequency spectrum and ideally pay very little for it, otherwise they add spectrum fees to the costs and increase the subsidy amount required. Equally important is to allow bidders to choose the technology to serve communities as freely as possible as this minimises the subsidy requirement if bidders can choose a mix of the most cost-efficient technologies.

Uganda's period of exclusivity over voice telephony will end in 2005. New entrants under the RCDF competitions will be allowed to use any proven technology, to offer voice and data services in their areas, and if they meet the obligations in their designated rural areas will have their foot in the door to expand and to become national operators later.

- ***Good regulatory design, including tariff freedom and fair interconnection*** – A sound regulatory environment enables the subsidies to be 'smart' in the sense of assisting with start-up of profitable ventures. In the Chilean case, operators are allowed to charge higher tariffs (up to a regulated limit) & the regulator has implemented cost-related asymmetric interconnection rates. The interconnection regime gives rural operators access charges that are several times higher than those of urban operators, based on the fact that the costs of rural networks are much higher than urban ones. This creates significant revenues from incoming call traffic and the incentive to exploit demand for incoming calls. As an example of the impact of this, the largest Chilean rural operator derives 60% of its total revenues from its positive interconnect balance with urban operators, allowing it to recover costs and develop the significant business opportunity from incoming calls. Colombia has also recently implemented a cost-based asymmetric interconnection regime for rural operators and Peru is planning to do so.

Two pillars of Uganda's rural communications development strategy are tariff flexibility and "special rural interconnect", a policy to implement asymmetrical access charges such that operators serving the designated high-cost rural areas will receive higher call termination fees. This will enable and incentivise them to develop the incoming call market – over 80% of rural Ugandans have relatives living in Kampala or overseas, who create a far heavier demand for calls into rural areas than outgoing. UCC plans use this to encourage operators to offer special incentives for rural payphone retailers to promote incoming call termination.

- ***Demand study and clear targets*** - Use of rigorous market research and demand analysis in the Fund establishment process was essential for the Fund administrator to identify areas in need of subsidies and to develop a licence and bidding strategy. It also provided helpful assistance to bidders. Most countries provided quite comprehensive data to bidders – in Chile, even specific payphone site locations were identified by local authorities, community associations, other organisations and the public at large (but nor prescribed).

The preparation for the Ugandan Fund also included a detailed "Rural ICT Baseline Study" in which the user needs, preferences and demand for all communications services were researched at the community and household level in every region of the country. This determined the level of supply that is demanded, the level of payphone and other ICT placement justified in the Universal access strategy, how the markets will develop, and which areas the Fund will need to focus on. This data has already been made available to existing operators, as stakeholders in the development of the country, and will also be will be made available to new bidders in the auction process.

### *Mobile communications: rapidly closing the market efficiency gap in Africa*

The development of the mobile sector in Africa is the best example of what the market can achieve once private sector initiative and competition is introduced. The explosive growth in mobile services, e.g. here in Kenya from under 50,000 customers to nearly one million within two years, has also led to more rural areas being covered and more low-income users being served. Mobile operators in several countries have also successfully embraced the provision of mobile public payphones. With competition, relative tariff freedom and high terminating interconnect rates, mobile operators close the market efficiency gap rapidly.

In addition, the mobile service and the mobile network have features which lend themselves to providing services to low-income customers. Comparing fixed and mobile services start-up and monthly recurring costs (including a small number of calls), Intelecon proved in a study[3] that mobile access, with a low volume of call minutes, is actually more affordable for users.

Affordability is only one reason many low-income users choose mobile service. Another important factor is ease of use through pre-paid services. Low-income customers need more than low prices: the ability to control their expenditure, being able to switch to just receiving calls in times of economic difficulty, hassle-free sign-up, and other similar features. Many Universal Service schemes in Western Europe and OECD countries recognise that. Prepaid offers crucial advantages for low-income users beyond affordability. Prepaid avoids credit checking, having a bank account and a binding long-term service contract and can therefore be used by people who already have bad debt and no steady income. In Africa (excluding South Africa), typically between 90 and 95% of total mobile customers use prepaid accounts.

In low-income countries, mobile networks can serve formerly unserved areas, including rural and marginal low-income customers, more economically due to certain features of its network economics and operation:

- Within total capacity limits, every additional marginal customer improves the bottom-line, since mobile investment per user is a function of economies of scale. The base-station is a single bulk investment and costs per user decreases continually as more mobile users share the service. In contrast, fixed-line investment can only capture the revenue of a single user unless it is a public payphone.
- In countries with a limited fixed network, the mobile operator is in many areas the “first-in” without competition from fixed services and can capture *all* pent-up demand. Users then often develop preferences for mobile service.
- Additional geographic coverage, outside of cities and along major roads is an important selling point to urban customers who travel throughout the country. Mobile operators often invest in coverage for roaming urban users. Capturing additional rural users is added income.
- The mobile operator can also benefit if the mobile user in rural areas makes only a few calls. It is a well-known fact that urban relatives generate a larger percentage of incoming calls to rural users. Attractive interconnect rates from fixed-to-mobile generate a considerable revenue stream for the mobile operator.
- Pre-paid service eliminates costly customer administration for the mobile operator: there is no credit checking, no billing and no money collection, and no exposure to bad debt.[4] This reduces operating costs considerably, provides cash up-front and the savings can be passed on to the customers.[5]

[3] Viewpoint, “Mobile operators: Their contribution to Universal Service and Public Access”, Sonja Oestmann, forthcoming publication

[4] Bad debt is a major cost item for many developing country operators e.g. Telemar in Brasil had bad debt of almost $67 million just in its third quarter in 2001.

[5] Fixed operators seem to have finally caught on to the benefits of pre-paid. Examples of fixed operators having introduced pre-paid recently are N-Soft in Gabon, Brasil Telecom, PLDT in Philippines, Telmex in Mexico and CANTV in Venezuela.

The impact for UAFs is that they will find that they can target some areas with lower subsidies *and* lower risks. The mobile explosion will also mean that some funds can focus almost exclusively on the most remote geographical localities.

In Uganda, the vast majority of the country will soon be covered by mobile and GSM based fixed-wireless service for basic access, leaving only 154 sub-counties out of 1,000 without phones. The RCDF will focus on supporting access to these sub-counties. However, it is expected that mobile operators will be able to serve many of these areas with minimal or zero RCDF support by the time the first tender is made, leaving less than 100 remote high-cost sub-counties to be served. This will be an increasing trend in developing countries with medium to high population densities.

The active presence of mobile operators in rural areas could also offer development funds new opportunities to deepen their role through micro subsidies. For example, Uganda's RCDF will support small grants or micro-loans to enable entrepreneurs wishing to set up public payphones in areas with weak wireless signals or with no power source to acquire special rural packages[6].

### *ICT development – getting it right*

The attention of several funds includes extending Internet access and advanced services, either as the next objective after telephony targets have been met or as a complementary goal. Three funds have implemented Internet access or telecentre/ infocentre programs so far: in Latin America the Colombian and Chilean programs, and the Universal Service Fund administered by the Universal Service Agency (USA) in South Africa. A few other funds are planning to include support for Internet points-of-presence or telecentres (e.g. Uganda, Dominican Republic and Bolivia). Peru's FITEL is also financing pilot projects involving the Internet.

Lessons thus far are drawn from telecentre projects in general and specifically from South Africa's USA first round of experience, which has implemented telecentres from as early as 1998. Promising ideas are also emerging from Chile's and Colombia's program, which has commenced very recently.[7] Various sources agree that only a few of the 90 or so South African telecentres supported by the USA are financially self-sustaining after the initial funding; a significant number are in serious trouble or have effectively closed. Even the best cases, e.g. Gaseleka[8], typically do not cover equipment depreciation and are therefore not self-sustainable in the long run without ongoing external support. The experience is similar to that of telecentres elsewhere, unrelated to Funds. However, well-managed telecentres with a variety of ICT enabled value-added services can have a high level of impact and be of tremendous benefit to rural and low-income communities. That is why the interest in them is justified.

Latest thinking is that, for most countries, telecentres need to be commercial, predominantly small-scale and led by entrepreneurs, in order to ensure sustainability and proliferation. Developing countries simply do not have sufficient resources to support a large number of multi-purpose telecentres on an ongoing basis. However, to date very few projects have been set-up on a commercial basis; for example, community-based organisations or NGOs sponsor most of South Africa's telecentres. *Colombia is the first fund to successfully implement a competitive bidding scheme for private operators, allowing economies of scale by bidding telecentres in the hundreds. This will facilitate telecentres to be run by local entrepreneurs in the community but with the support of a network and management organisation*.

Taking the balance of experience thus far, it is clear that policy-makers can support Internet and ICT based service development in a variety of ways, but need to take a step-by-step approach that focuses more on the supporting environment than direct finance. It is important not to distort

[6] A rural package, costing under $500, comprises a desk-top fixed GSM handset, simple rooftop pole and antenna, and personal sized solar panel. Management of the disbursements in the micro program may be outsourced to a micro-finance agency.

[7] In late 1999 GVT (Gilat Satellite Networks) won the first Compartel phase to install 6,745 payphones and 670 Internet access points which they completed at the end of 2001. Phase 2 was declared void and in April 2002 Compartel received a sole bid from Gilat for Phase 3 to install 500 community telecentres in a pre-qualification bid. The results are expected end of June 2002. At end of 2001 Chile awarded subsidies for 55 urban infocentros designed to assist SMEs. A tender for over 100 rural telecentres is underway and proposal opening is scheduled for September 2002.

[8] See The Gaseleka Telecentre, Northern Province, South Africa, Peter Benjamin, in Commonwealth of Learning, *Telecentres: Case studies and key issues*, 2001

a just-emerging market, and funding should be limited to the minimum required. The following are the measures needed and it should be noted that only three involve direct financial support.

**Internet and ICT service support mechanisms**

- Start with removing any barriers to the development of the Internet and ICT services market, such as allowing IP Telephony, nation-wide local call tariffs for Internet dial-up, easy licensing for ISPs, access to (international) bandwidth and promoting national IXP exchanges, etc.;
- Develop public services online (e-government, tele-health, tele-education etc.) and content to create applications and stimulate demand in telecentres;
- Offer subsidies for Internet infrastructure first, e.g. small subsidies to establish Points of Presence (POPs) in every rural district, as planned by the Ugandan fund;
- Support Internet connectivity and PC labs for schools, requiring the schools to cover their operational expenses through opening their facilities during off-hours for wider community access;
- Promotion and awareness creation of telecentres through conferences, workshops and training opportunities for local entrepreneurs;
- Only where the market does not reach commercially, offer support to telecentre start-ups through competitive bidding procedures, following the successful principle and practice of the rural telephony funds; and
- Develop guidelines and requirements that improve the prospects that commercially run telecentres can fulfil the function of assisting rural and low-income communities in their social and economic development.

## *Conclusion*

Experience from some developing countries is demonstrating that the Universal Access Fund model is the most effective available to extend the reach of the telecommunications market into challenging rural areas. However, experience within Africa as well as from elsewhere is showing that this model does not relieve Governments from having to implement sector reform, liberalisation and good regulation. Policy and regulatory factors are *at least* as important as special finance in ensuring that operators and service providers are motivated to cross new boundaries as solution providers. The encouraging sign is that the mobile revolution is pointing the way towards narrowing the market gap between 'have' and 'have-not' areas and communities. With the application of sound policy and regulations focused on removing barriers to efficient operation of the market place, there is a realistic opportunity that targeted 'smart subsidies' through the universal access fund mechanism can also be effectively deployed to reach even the most challenging areas.

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