

Cluster Four Assessment Report

Important Note: Many of the issues arising in connection with governance arrangements related to developmental aspects of the internet are in common with other important areas of relevance to Internet governance. This paper should be read in parallel with the paper entitled: *Towards a Common Understanding of the Roles and Responsibilities of the Stakeholders in Internet Governance* which attempts to encapsulate discussion of the more generic issues.

Report card I:**1. Issue: Affordable and universal access**

Universal access relates to providing communities with affordable access to ICTs and has three main components: availability, accessibility, affordability. [Note: see ITU, WDR 2003 Chapter 4]

The shift to a greater role for the private sector, while dramatically increasing access and reducing prices over the past decade, has also resulted in widening inequalities in many instances as the potential to enforce universal service obligations and/or use creative approaches to licensing have not kept up at the same time that the scope for other stakeholders to act – e.g. the public sector or community based/owned – has been limited.

While the potential to increase access is a function of the regulatory and policy environment and actions of the public and private sectors at the national level, it is also greatly affected by

- (i) Regional and global trade agreements (e.g. WTO) on investment and trade in services which have used to increase liberalization, privatization and to open up sectors earlier closed to the foreign private sector,
- (ii) The lack of adequate financial and policy mechanisms to address the needs of under-served areas and the limitations in the policy and financial space for national governments to craft such mechanisms in various instances;
- (iii) The development-policy divide at the national level and development cooperation levels, that have worked against mainstreaming the use of ICT to address development needs and catalyze

2. Institutions:

Affordable and universal access issues are dealt with by a range of actors at international, regional and national levels by all stakeholders including:

International: InfoDev, ITU-D, UNDP, UNESCO, World Bank, WTO

Regional: European Union, NEPAD, regional banks and economic commissions

National: Post and Telegraph agencies, Rural Development Agencies, Universal Service Agencies, Donors

Private Sector: ISPs, IXPAs, Service Delivery agents, Telecom network operators

Civil Society: Community Telecenters, Community Development Centres, Community Media

Multi-stakeholder: UNICT Task Force, Global Knowledge Partnership

3. Relationship to the Internet:

The importance of access to knowledge and information –global and local - and services that can be delivered through the Internet has broadened the scope of universal access from access to *basic voice telephony* (and the need to particularly address access gaps in remote or, rural or underserved areas, which were not attractive investment opportunities for the market in telecom services) to incorporate access to the Internet.

The notion of the *digital divide* in effect encompass not just the telephony and hardware gaps but also those relating to content, language and applications and capacities to effectively use these technologies to access and contribute to the full spectrum of information and communications services that are becoming viable as the convergence of technologies increases in momentum and facilitates a reduction in cost of provision.

There is however still a debate about the various components and dimensions of the divide, with some arguing for the primacy of the telephony divide which is seen to be more easily addressed.¹ It is thus still unclear to what extent the notion of universal access and the instruments to realize it have taken on board the convergence of technology to the point where universal access means not only access to basic voice telephony but also access to the internet.

Affordable, available, accessible universal 'access for all' is one of the most critical public policy issues and is a major factor contributing to 'digital divide'.

Access is paramount in enabling all to be empowered to self-determine their lives in economic, political, social, cultural and environmental sectors of society.

This divide exists between developed and developing countries, within all countries between urban and rural communities, rich and poor, young and old, women and men.

The digital divide is compounded by issues of social inclusion, relevant content, content in appropriate formats and languages, lack of capacity, skills, expertise and know-how and so on.

The digital divide impacts on developing countries' capacity to

- facilitate participation of all in the 'information age'
- promote national economic, political and social cohesion;
- support information and communication rights for all;
- promote economic development;
- reduce urban-rural disparity;
- contribute to poverty alleviation;
- take up challenges posed by global technological and economic trends;
- prevent their increased marginalization from the global networked economy;
- deliver on developmental objectives.

While mobile and fixed telecommunication rates and international telecommunication rates are coming down in most of the world, telecommunication costs are much higher in Africa and the Caribbean than other regions. This leads to low internet penetration and to low-income consumers spending a disproportionate share of their income on cellular telephony. There is a danger of a vicious circle emerging in which Africa and the Caribbean and other small island states are locked into an ever-increasing disparity in affordability and access compared to the rest of the world. In this regard, particular attention needs to be given to the issue of universal access in these regions and new solutions found.

4. Governance Mechanism:

To the extent that governance implies "the collective rules, procedures, and related programs intended to shape social actors' expectations, practices, and interactions concerning Internet infrastructure and transactions and content" the 'developmental' cluster of issues presents the greatest challenge in terms of assessment of existing mechanisms.

Governance mechanisms in relation to affordable and universal access are diffuse, multi-layered, inter-dependent and impact at individual, community, national, regional and international levels. In this respect, it is beyond the realms of this paper to comprehensively assess all aspects of all governance mechanisms which impact on this issue.

The key global governance mechanism regarding universal access is the WTO Regulation Reference Paper that is part of the WTO Agreement on Basic Telecommunications. Section 3 of the Reference Paper on Universal Service reads as follows:

"Any Member has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive per se, provided they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the Member."

¹ The lead article on the digital divide in the Economist (March 10, 2005) in effect argued that the extension of mobile telephony was the way to bridge the digital divide and that Internet access as made available through tele-centres was of secondary value as a tool for development to poor people who were illiterate and unable to take advantage of internet access.

However, Section 1.1 deals with the ‘prevention of anti-competitive practices in telecommunications’:

Appropriate measures shall be maintained for the purpose of preventing suppliers who, alone or together, are a major supplier from engaging in or continuing anti-competitive practices.

One of the anti-competitive practices is engaging in anti-competitive cross-subsidisation. This in effect outlaws one of the previous ways of promoting the affordability, and hence accessibility of telecoms services, in which public telecom operators cross subsidized the cost of local calls by charging higher rates for long distance and international calls.

The telecom sector reform model with its introduction of competition meant that public telecom operators needed to rebalance their tariffs by making tariffs reflect the actual costs of services offered and thereby to remove the cross-subsidisation of local services by long distance and international services.

Any country that is a signatory to the WTO Agreement on Basic Telecommunications is liable to a complaint to the WTO from other signatories if it utilizes a universal service mechanism that infringes the Agreement.

At the national level, governance of the issue of universal access takes place through the ICT policy and legislation which the government puts in place, and the regulatory authority established to regulate the ICT sector.

Financing ICTD and Universal Access

Four findings of the Task Force on Financial Mechanisms are relevant to the issue of universal access:

3. Experience shows that attracting investment in ICT depends crucially upon an enabling environment that is supportive of the private sector and for business as a whole, and an ICT policy and regulatory environment that encompasses open entry, fair competition, and market-oriented regulation.

The explosion of ICT sector investment in most developing countries correlates closely with the improving environment for private investment and the transformation of formerly closed, monopoly ICT markets to allow competitive entry. Where Governments have actively pursued an open, equitable market environment, investors have generally welcomed the opportunity to compete. Introduction and strengthening of independent, neutral sector regulation has helped to reinforce investor confidence and market performance, while enhancing consumer benefits.

4. There is evidence to suggest that the broad-based deployment of ICT also depends on a supportive development policy environment for ICTD particularly the establishment of national e-strategies and the integration of ICT into poverty reduction and/or other national development strategies and the PRSP process.

Over 90 countries have developed or are in the process of completing national ICTD strategies. These strategies, typically designed on a multi-stakeholder basis, have been important in establishing national ownership and in outlining a set of key priority areas for intervention. Many of these have also linked to priorities outlined in the national poverty reduction other development strategies, the success of which critically depends upon effective information management tools and applications, communication, and coordination across all public agencies and programs. The process and content of the poverty reduction and other development strategies are also key for donors who align their aid and partnership strategies to the priorities outlined therein.

5. Policy and regulatory incentives and more open access policies are also needed if private investment and community networks are to be effective in expanding ICT access to high cost (predominantly rural) and low income populations to address the so-called “bottom of the pyramid” populations.

Addressing policy barriers, removing restrictions on competitive entry by ICT companies and local community network operators, and permitting the use of cost effective technologies (e.g. VOIP, and on unlicensed spectrum), and other innovative practices have been found to be helpful in moving the network frontier to address the needs of currently under-served populations. Continued cooperation between various development partners and stakeholders can also help in addressing the problems of providing rural access using new technological applications including wireless broadband devices, offering incentives to Internet cafes, phone shops and community communications networks.

10. National Universal Service/Access Fund and other mechanisms to lower costs of delivery to underserved markets and promote community access can play an important role in helping to address ICT access gaps, but require substantial institutional and implementation capacity to succeed.

More than sixty countries have begun to establish Universal Access Funding mechanisms as a core component of their ICT development policies, to bring together financial resources in support of extending access beyond the market frontier. Successful models of UAFs introduced in Latin America and elsewhere have indicated that, properly implemented in a *competitive* environment, these mechanisms can play a critical role in leveraging market forces to expand access to public telephone service, multipurpose community telecenters, and other ICT facilities. Experience to date is mixed as this trend is very new in much of the developing world, and most countries are just beginning to address the vital policy, regulatory, institutional, and capacity issues required for successful management of these Funds. There are also possibilities for scaling up these funds through innovative financial mechanisms and schemes. Periodic assessment and evaluation of these mechanisms, together with other Universal Access development programs, can help define their future role in the sector within many countries.²

Universal Access: enabling the goals of development

Essentially the issue of universal access operates between the space of what the market can provide and interventions to extend access beyond the frontier of what the market can provide. In this space, the development of universal access funds is important, but there is now also a question of shifting the paradigm of ICTD towards a real engagement with the development sector as a whole. This is being driven by the shift from the G8 initiatives around the DOT Force and Digital Opportunity Initiative, which attempted to address ICT for development in the immediate post-millennial period and which produced the basic model for ICTD, **Creating a Development Dynamic**³ to an approach that looks at greater community involvement in provision of services, open access models, the use of new wireless technologies and a closer integration with development projects in the context of implementing the Millennium Development Goals.

The issue of universal access is moving beyond being a matter purely of telecommunications policy and regulation to one that is integral to enabling the goals of development. It therefore becomes a matter not only of universal access to telecommunications, but also access to ICTs in a context of **development**. ICTs include the new forms of internet access, traditional telephony, as well as broadcasting media such as community radio. To engage with the issue of universal access means engaging with the issue of ICT for development.

In this regard strategies of International Financing mechanisms (IFIs) such as the World Bank 'Poverty Reduction Strategies' impact directly on financing of universal access initiatives in developing countries and inform most developed country 'Overseas Development Assistance' (ODA) programmes which directly or indirectly finance universal access initiatives. This paper does not assess such mechanisms, though they relate directly to achieving universal access solutions, but this paper should be read in conjunction with the findings and recommendations of the various stakeholders active in the WSIS Task Force on Financing Mechanisms (TFFM)⁴ and the Millennium Project report⁵.

This paper focuses on governance mechanisms that exist at international, regional and national levels which lie at the periphery of the 'soft' end of the governance mechanism scale, which can be roughly clustered into the following areas.

- Research, reports and analysis
- Statistics and indicators
- Trends, Toolkits, 'best-practice', case studies

² Executive Summary, Report of the Task Force on Financial Mechanisms, UNDP, 2005

³ www.undp.org.in/images/DOI-Final-Report.pdf

⁴ http://www.itu.int/ws/s/documents/listing.asp?lang=en&c_event=pc2|2&c_type=r

⁵ Millennium Project Report to the UN Secretary General: Investing in Development: A Practical Plan to Achieve the Millennium Development Goals Earthscan 2005 <http://www.unmillenniumproject.org/reports/index.htm>

- Policy discussion forums
- Policy models, strategies, principles and frameworks

Collectively, these activities contribute significantly to generating discourse and innovative thinking, informing and guiding policy formulation and provide tools for capacity building for decision-makers and practitioners at all levels from all stakeholder groupings.

Research, reports, analysis

Research has been conducted into universal access by most of the international institutions mentioned in this report. In the developing world there are a number of research centres carrying out research into access that include the LINK Centre and bridges.org in Africa, ITeM in Latin America and 'IT for Change' in India.

InfoDev, ITU-D, UNDP and the World Bank have research/study/working groups that conduct research and produce reports and publications in relation to affordable universal service.

All of these organizations are key players in the ICT for Development Sector and the outcomes of their work has significant impact on emerging discourse, policy frameworks and recommendations and has indirect and direct implications for financing of 'access for all'.

The work of InfoDev and UNDP focuses on exploring ways in which uses of new technologies (including wireless), at the 'outer edges' of existing national backbone networks provide opportunities for 'bottom up' or 'from the edge' models, a 'significant departure from the traditional model of growing networks "out from the center" in a top-down fashion'. InfoDev refers to this model as the 'Open Access Model'⁶, UNDP's most recent work explores "'pro-poor' approaches to universal access challenges in rural areas and the importance of recognizing the potential for community-owned networks to contribute to addressing access, services and financing issues."⁷

The OECD's work focuses on Regulatory Reform, Universal Service Obligations and guidance for donors on risks and opportunities of involvement in Universal Access policy/ Universal Access funds to extend telecommunications services to the rural poor⁸.

Analysis, Statistics and indicators

Accurate analysis, statistics and indicators are important tools in informing research and guiding policy priorities. Statistics and indicators in relation to 'the information society' are a relatively new area and the work of the ITU in this respect is very valuable.

The ITU produces the annual 'Trends in Telecommunications Reform'⁹ and 'World Telecommunication Development Report'¹⁰. Both of these reports contain invaluable information for policy makers and practitioners from all stakeholder groupings, the latter including "'Access Indicators for the Information Society", and has been specially prepared for the first phase of the World Summit on the Information Society, December 2003. In addition to analysis, the latest telecommunication indicators for some 180 economies worldwide are provided."

Policy discussion forums

The UN ICT Task Force has addressed the issue of universal access in the context of ICTD in a number of forums and publications such as Creating an Enabling Environment: Toward the Millennium Development Goals¹¹, The Role of Information and Communication Technology in Global Development - Analyses and Recommendations¹² and the annual international conferences on 'Open Access technologies' (with The Swedish International development Agency ([Sida](#)) and The Royal Institute of Technology ([KTH](#))¹³.

⁶ UNDP Open Access Models http://www.infodev.org/section/programs/enabling_access/open_access

⁷ UNDP 2005: *Innovative Technologies and Community Ownership: A New Model of ICT Access for the Rural Poor*

⁸ OECD Development Assistance Committee (DAC) Network on Poverty Reduction (POVNET)

⁹ <http://www.itu.int/publications/docs/trends2003.html>

¹⁰ <http://www.itu.int/publications/docs/bdt/wtdr03.html>

¹¹ <http://www.unictaskforce.org/perl/documents.pl?id=1489>

¹² <http://www.unictaskforce.org/perl/documents.pl?id=1360>

¹³ <http://www.openaccess.uem.mz/>

The Swiss Agency for Development and Co-operation (SDC) and Global Knowledge Partnership (GKP) have held fora on access and ICTD and produced publications such as ICT4D – Connecting People for a Better World.¹⁴

Policy models, strategies and frameworks

The issue of universal access is a component of the telecom sector reform model introduced during the 1990s. Telecom reform essentially involved four elements:

1. The privatisation of the public telecom operator;
2. The introduction of network competition in fixed and mobile telecommunications and services-based competition in value-added data services and internet service provision;
3. The introduction of independent regulators to oversee the reform of the sector;
4. The shift of approach to universal access from cross-subsidisation to universal service obligations and universal access funding.

This policy model formed the basis for the WTO Regulation Reference Paper and continues to be the primary model for dealing with universal access policy with respect to telecommunications. However, this element of telecom policy is itself under a process of transformation into a new policy framework for information and communications (ICD), in which the implicit assumption in the term ICTD by emphasising ‘technology’ creates the perspective that it is sufficient simply to supply the technology rather than recognising that the context in which the technology is used, by whom and with what capacities and for what development goal is more important than the simple supply of the technology itself.

This shift in the policy dimension seeks to address the basic supply and demand conundrum involved in the extension of universal access:

It is clear that low teledensity levels in many developing countries have two distinct causes: (1) undersupply of telecommunications services due to inadequate sector policies, and (2) low demand due to low incomes. The first cause should be addressed first. The most effective and lowest-cost means to increase teledensity in countries that have not already done so is to implement telecommunications sector reforms such as competition, privatization and pricing reform (e.g. price rebalancing). Evidence around the world suggests that reforms of this type will remove many supply constraints on the sector. However, such sector reforms will generally not be sufficient to address the second cause of universality problems – insufficient local incomes to support the rollout of telecommunications networks.¹⁵

In the new context of ICD, while the role of Universal Access Funds assume increasing importance, so also does the issue of finding practical solutions to ICT access in a context of development and it is here that a new ICD paradigm is evolving around the use of new mainstream technologies such as VoIP and Wi-Fi and in developing techniques such as Delay Tolerant Networking and WiMax.

This involves recognizing that while the market is important and sector reform is important to create an enabling policy environment for the extension of ICT-enabled services, more needs to be done within the development zone to ensure that the complex dynamics of capacity building, appropriate applications and content as well as affordability receive attention from policymakers and the development community.

Trends, Toolkits, ‘best-practice’, case studies:

InfoDev:	Enabling Access For All: http://www.infodev.org/section/programs/enabling_access Open Access Models for Information and Communication Infrastructure: Some Basic Principles
ITU	Regulators forums, Guidelines, best practice, toolkits, access indicators Universal Access Regulatory Best Practice Guidelines http://www.itu.int/ITU-D/treg/Events/Seminars/2003/GSR/Documents/BestPractices_E_31.pdf

¹⁴ <http://www.sdc.admin.ch/ict4d> or <http://www.globalknowledge.org/ict4d>

¹⁵ Infodev: Telecommunications Regulation Handbook, World Bank 2000 www.infodev.org/projects/314regulationhandbook, p6-8

	<p>Trends in Telecommunication Reform 2003, 5th Edition Promoting Universal Access to ICTs - Practical Tools for Regulators http://www.itu.int/publications/docs/trends2003.html</p> <p>World Telecommunication Development Report Access Indicators for the Information Society 7th edition, 2003 http://www.itu.int/publications/docs/bdt/wtdr03.html</p>
OECD/DAC	<p>PovNet documents Policy discussion forums, best practice, policy analysis, statistics and trends</p> <p>OECD Resources on Internet Governance: Issues Relating to Developmental Aspects of Internet Governance http://www.oecd.org/document/7/0,2340,en_21571361_34590630_34644551_1_1_1_1,00.html</p>
UNESCO:	<p>Policy frameworks for international co-operation and international and regional partnerships; development of common strategies, methods and tools</p> <p>‘Information For All programme’ http://portal.unesco.org/ci/en/ev.php-URL_ID=1627&URL_DO=DO_TOPIC&URL_SECTION=201.html</p> <p>Note: whilst this programme focuses more on access to information for all, the <i>“Recommendation concerning the Promotion and Use of Multilingualism and Universal Access to Cyberspace”, adopted in October 2003 by UNESCO’s Member States¹⁶</i>. Contains specific recommendations related to “Facilitating Access to Networks and Services” which is relevant to this issue.</p>
World Bank:	<p>Global Information and Communication Technologies Department http://info.worldbank.org/ict/</p> <p>‘Privatisation toolkits’ → telecommunications → module 6: http://rru.worldbank.org/Toolkits/TelecomsRegulation/Download.aspx</p>
WTO:	<p>WTO Regulation Reference Paper, Annex to the Fourth Protocol of the GATS Agreement, the “Agreement on Basic Telecommunications”, February 1997 http://www.wto.org/english/tratop_e/serv_e/12-tel_e.htm</p>

National

There are several mechanisms employed at the national level through telecommunications or ICT policy seeking to achieve universal access which include:

- Establishment of specific universal access funds.
- Mandatory service obligation imposed by licence conditions or other regulatory measures.
- cross subsidies between or within services provided by incumbent operators.
- Rollout of community telecentres.

5. Evaluation against WSIS criteria:

¹⁶ http://portal.unesco.org/ci/en/ev.php-URL_ID=13475&URL_DO=DO_TOPIC&URL_SECTION=201.html#accessresearch

5.1 Process Criteria To what extent to the institution's Internet-related governance mechanisms meet the following criteria, given what could be reasonably expected in light of the governance mechanism used?

- *Multilateral*
- *Transparent*
- *Democratic*
- *Full involvement of governments, the private sector, civil society and international organizations*

The universal service provision of the WTO Regulation Reference Paper is located within an institution, the WTO, which is multilateral, transparent and democratic and involves the full participation of governments. The full participation of civil society, the private sector and international organizations is not present.

5.2 Role and responsibility criteria (To what extent do the institution's Internet-related governance mechanisms enable the different stakeholder groups to fulfill their roles and responsibilities as defined by WSIS? To what extent to the different stakeholder groups have the capacity to fulfill their roles and responsibilities?)

- Governments
- Private Sector
- Civil society
- Intergovernmental organizations
- Other international organizations

The WTO's governance mechanisms enable governments to fulfil their roles and responsibilities. Other stakeholders do not have responsibilities within the WTO, but have an important role in the implementation of the universal service provision of the Reference paper.

5.3 Outcome Criteria (How effectively to the institution's Internet-related governance mechanisms contribute to achievement of the following goals?)

- Equitable distribution of resources
- Access for all
- Stable and secure functioning
- Multilingualism

With respect to 'access for all', the WTO's Reference Paper sets criteria within which universal service mechanisms are to operate, i.e. that such mechanisms will not be regarded as anti-competitive if they are administered in a transparent, non-discriminatory and competitively neutral manner and are not too burdensome. The role of the WTO is not to promote universal access for all – only to mark out the limits to the operations of universal service mechanisms within its trade and competition framework and limit its potentially anti-competitive effects. Currently, there is no international governance mechanism specifically concerned with promoting universal service or access. It could be argued that in the framework of the Doha Development Agenda the Reference Paper should be reviewed in order to make it more development friendly .

6. Coordination: How effectively is governance of this issue coordinated with governance of other Internet-related issues?

There is no coordination with the governance of other Internet-related issues.

7. Overall assessment: What are the points that most need improvement in order to meet the WSIS criteria?

In relation to the 'hard' governance mechanisms: Universal access is a matter of public policy that requires attention in its own right within the relationship between ICTs and development.

Without proper attention to universal ICT access as a global, regional and national public good, the important goal of achieving universal access to the internet will not be achieved.

Extending universal ICT access in developing countries is a public good that benefits everyone because of the value of network externalities. The value of the information and communications network increases as more users are added.

In this context, the question needs to be addressed in what forum this issue should be dealt with. In current arrangements it is more of a by-product of the WTO's trade and competition rules. Should these rules in future also deal with questions related to universal access? Should this be taken up by the WTO then also the full involvement of all stakeholders would have to be looked into.

In relation to the 'soft' governance mechanisms: there is little coordination between the various initiatives that are exploring innovative and creative means to address universal access, particularly regards 'open access', community owned and led and other approaches.

Annex 1: Sections from the Report of the Task Force on Financial Mechanisms on universal access:

3.2.3 Universal Access Funding

Developing nations have begun to employ several “universal access” mechanisms to expand access to telecommunications for high cost (rural) and low income users. One such mechanism is the Universal Access Fund (UAF)¹⁷ which is being promoted as a central means for mobilizing domestic private and public financial resources and leveraging outside support as well. Properly designed and implemented, and with sufficient internal resources and expert capacity, the UAF model has the potential to serve as a central “clearing house” within each given country for a variety of funding sources and development projects, to reduce inefficiencies and improve coordination across the spectrum of ICT development and financing initiatives.

UAFs are seen as a competitively neutral solution for open market environments, where all operators in the market are obligated to share the responsibility (and the benefits) of providing universal access. About 60 countries worldwide have established or are in the process of establishing a UAF.¹⁸ In general, the principal motivation for establishing a UAF is the notion that initial start-up investment and costs are the main barrier to serving rural, remote and perceived unprofitable areas. The adoption of a UA program in theory reflects a belief that expanding access is a public commitment, as well as a wider understanding that the benefits of ICT development are universal, with externalities that accrue not only to new subscribers but to all citizens and businesses in the economy, particularly ICT businesses themselves.

UAFs are typically administered by the national regulatory agency or an independent body (e.g., the Universal Service Agency in South Africa) and under the policy guidance of the policy maker, usually the Ministry of Communications. UAFs are normally financed by sector revenues (e.g., Dominican Republic, Peru, South Africa, Uganda), government budgetary allocations (e.g., Chile, Colombia, Nepal), and in some recent cases include contributions from donors and international financial institutions (e.g., Nicaragua, Nigeria, Mozambique, Uganda, Sri Lanka). In Guatemala, the fund was partially financed by licensing or spectrum fees. Countries select financing modalities based on the private and public sector environments in their country, but also based on their own ability to contribute to the Fund. The recent trend of donor contributions to UAFs provides an opportunity but can not be perceived as the major source of financing.

Experience with UAFs to date is mixed, with well publicized success stories in some countries (e.g., Chile, Colombia, Peru), and slow starts and bureaucratic difficulties in others (e.g., Bolivia, Brazil, Nepal). The most successful experiences began during the 1990’s in Latin American countries, such as Chile, Peru and Colombia, where the UAFs have supported extensive deployment of public phones in rural and remote areas, and have effectively strengthened the presence of rural operators. These funds originally focused on the provision of public telephony services but have more recently expanded to cover Internet access and advanced ICT projects, including multi-purpose telecenters.

The UAF mechanisms in Latin America have implemented so-called “smart subsidy” mechanisms or minimum subsidy auctions, where bidding firms competed for subsidies from the Fund based on the lowest subsidy requested and/or greater investment commitment to provide service in a designated area or region. Bidding firms are encouraged to plan their investment activities based on best technology available and most cost-effective practices. While there are some risks with this approach, such as under-bidding by smaller firms that may jeopardize their financial sustainability,¹⁹ this mechanism has actually been quite successful in the expansion of access (see Table 1). It is also interesting to note that in the case of Chile and Peru, US\$1 of public investment leveraged about US\$6 and US\$2 of private investment respectively.²⁰

In South Africa, where the Universal Service Agency administers a UAF that focuses on the deployment of telecenters throughout the country, the experience has been more mixed. Numerous telecenters have been established using Fund resources, but longer-term sustainability continues to be a challenge to a great majority of the projects. Although funds were available for business and management training, it appears that the Agency did not have adequate internal resources, human and financial, to be able to properly implement its mandate. The Agency has also gone through several restructuring phases and has recently tried to develop a clearer mission. Proposals to increase the size of the Fund are currently under review. One of the many interesting and positive aspects of the South African telecenter program was its policy to ensure that at least 50% of telecenter managers and owners were women or women’s organizations.

¹⁷ For purposes of this report Universal Access Funds (UAF) also include Funds such as Telecommunications Development Funds, Rural Development Funds, and any other naming referring to Funds established to support and finance access in underserved areas.

¹⁸ ITU, Trends in Telecommunications Reform, 2003.

¹⁹ See Andrew Dymond and Sonja Oestmann, “Rural Telecommunication Development in a Liberalized Environment: An update on universal access funds”, in *ICT & Development*, World Bank, GICT, December 2003.

²⁰ ITU, 2003.

There are a variety of new approaches and ideas being pursued in many of the newer UAFs that have been established in recent years. Experience in Uganda, where about 80% of the population lives in rural areas, reflects such developments and shows promising results that others may replicate. In Nepal, also with about 85% of the population living in rural areas, the UAF is supporting a rural operator deploying public telephones through the country. In the Dominican Republic, the Telecommunications Development Fund also supports e-learning and telemedicine projects. The Dominican Republic case is important because it illustrates how the UAF is closely linked with the country's development objectives and ICT strategies. (See Box 3.2.3.1)

Table 3.2.3.1 Universal Access Fund Financing in Latin America

Country	Name	Source of Finance	Period	Localities served	Population served (approx., thousand)	Maximum subsidy available (US\$m)	Subsidy granted (US\$m)	Subsidy per locality (US\$)
Chile	Fondo de Desarrollo de las Telecomunicaciones (FDT)	Government budget	1995-97	4,504	1,650	24.2	10.2	2,256
			1998-99	1,412	500	14.4	9.8	6,919
			2000	143	50	1.9	1.8	12,727
Peru	Fondo de Inversión en Telecomunicaciones (FITEL)	1% Operator levy	1998	213	75	4.0	1.7	7,981
			1999	1,937	700	50.0	11.0	5,700
			2000 (1)	2,290	825	59.5	27.8	12,100
Colombia	Fondo de Comunicaciones (Compartel)	Operator levy & Government contribution	1999	6,865	3,700	70.6	31.8	4,600
Guatemala	Fondo para el Desarrollo de la Telefonía (FONDETEL)	Spectrum auctions	1998	202	200	N/A	1.5	7,587
			1999 (2)	1,051	1,100	N/A	4.5	4,282
Dominican Rep.	Fondo de Desarrollo de las Telecomunicaciones (FDT)	2% Operator levy	2001	500	770	4.0	3.4	6,800

Notes: (1) Implementation delay due to subsidy winner disqualified & subsidies awarded to second bidders.

(2) Actual fund disbursements, but network not implemented due to operator failure

Source: Andrew Dymond and Sonja Oestmann, Rural Telecommunication Development in a Liberalized Environment: An update on universal access funds, in *ICT & Development*, World Bank, GICT, December 2003.

Box 3.2.3.1

Uganda: Towards Universal Access to ICT

After the introduction of sector reforms in 1996, the Uganda Communications Commission (UCC) created the Rural Communications Development Fund (RCDF) in 2001, funded by 1% of all operators revenues. To publicize the Fund, raise interest and fine tune its knowledge on the process and methodology, the UCC successfully implemented the first RCDF pilot projects using a minimum subsidy auction:

1. to install and operate 70 public telephones in 70 unserved rural locations (MTN was selected),
2. to establish 26 Internet points of presence (POPs) in district capitals (UTL was selected),
3. to establish 5 Internet cafés, 2 ICT training centers (several firms selected), and
4. to develop 26 district information portals (Uganda Home pages was selected to develop local content and the activity is fully funded).

The experience of the RCDF in Uganda is promising and illustrates how the Funds can be used for different types of investments (including infrastructure, service provision, content development) but most importantly for different amount of investment (i.e., from larger amounts to micro subsidies). The UCC received donor support for the auction and implementation process, and the World Bank contributed with about 80% of the subsidy requirement for the projects. The UCC is expected to initiate a second auction in 2004 for the provision of 800 public telephones in underserved areas. However, as the country's wireless coverage increases, the Fund will focus on supporting the smaller number of locations without wireless access.

Box 3.2.3.2

Dominican Republic: focusing on ICT for development

The UAF in the Dominican Republic, or Telecommunications Development Fund as it is known in the country (TDF), is anchored in a strong socio-economic policy document, where ICT are clearly defined as enablers of development. It sets a strong foundation for project implementation and it provides guidance on how to prioritize among different projects within the context of ICT for development. Specifically, the policy document states that the Funds practical objectives are to:

- *Provide universal access to basic telephone communication throughout the country, where access should be viewed as both a right for all citizens, and an essential foundation for national development.*
- *Provide access to advanced communications capabilities, particularly Internet and e-mail, as extensively as possible.*
- *Provide support for economic development throughout strategic deployment of high quality, advanced telecommunications.*
- *Provide direct support to public and community service institutions, including education and health care facilities, government offices, among others.*

Indotel, the regulator and agency responsible for the administration and implementation of the Fund, has embraced these objectives, and in addition to infrastructure financing (public telephones) has implemented a number of projects, particularly in the areas of telemedicine, tele-education, telecenters, rural telephony and most recently on e-governance.

<http://www.indotel.org.do/>

The path ahead: There are two critical, and potentially complementary, needs that can in principle be addressed through Universal Access programs, including the mechanism of Universal Access Funds or their equivalent, within each developing country. These are (1) the urgent need to promote further extension of ICT access networks and facilities into less viable market areas, through shared industry and public investments, and (2) the imperative to establish effective and coordinated implementation mechanisms for diverse ICT development strategies, and for channeling of financial resources to priority goals. The first activity, extending universal access, has been the main focus of UAFs to date, while the tasks of implementing

other ICT strategy projects and financing has often been diffused among multiple Ministries and government offices, NGOs, outside donors and funding agencies, with inadequate coordination and planning.

As the role of ICT in development strategies becomes more prominent, and as new and existing financial mechanisms enhance their focus on the range of funding options and needs, this coordination function will become increasingly critical. There must be a common, centralized institutional framework to:

- conduct expert studies of public needs, market forces and trends, the evolving interplay of technology with socio-economic conditions, and other issues on an ongoing basis, collecting key data and distributing findings across all sectors;²¹
- recognize complementarity and synergies among financing and deployment options, and coordinate implementation strategies among stakeholders with separate agendas;
- evaluate the effectiveness of projects and policies in relation to resources, and study alternative practices and ideas;
- foster public political awareness, participation, and consensus building relative to ICT development goals, financing initiatives, and strategic implementation.

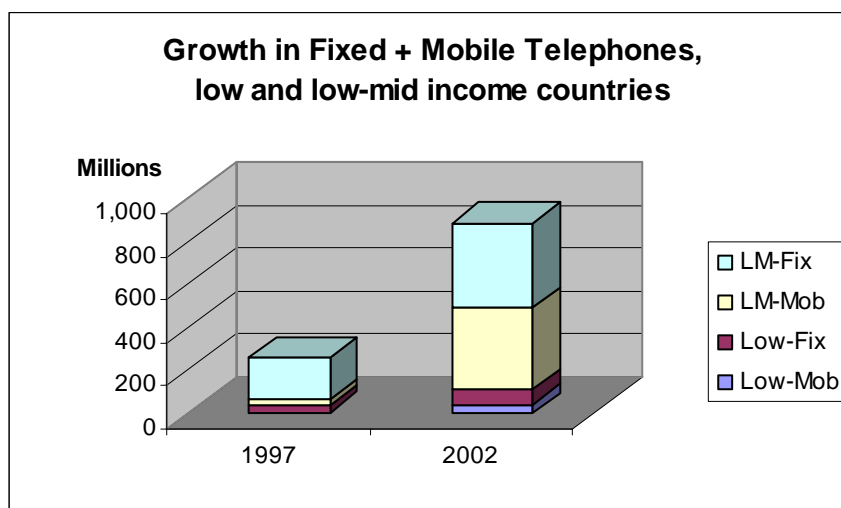
In reality, most UAF administrations are not yet equipped to take on this range of responsibilities for both access funding as well as broader ICT strategy financing and implementation. And it may be that the existing UAF institutional frameworks are not always the most appropriate vehicles to achieve such high-level coordination and planning. On the other hand, the basic structure of the UAF model represents a potential starting point for this broader implementation role: studying priority needs, managing contracts and bidding processes, evaluating program effectiveness, as well as channeling diverse funding resources in productive directions.

What these organizations most require is the capacity, principally in the form of human resources, to expand and enhance their role within the sector. This includes expertise in ICT economics and technologies, as well as development topics in general, along with public management, accounting, and similar skills. In addition, the enabling laws and regulations governing UAF functions must clearly delineate their obligations to pursue open, transparent, competitively neutral, and accountable procedures, including active public and industry participation in strategic planning and decision making, to ensure the legitimacy of their activities and their ongoing political viability.

4.3 Ensuring Effective Access

The fundamental challenge of ICT development is to devise means to ensure that virtually all citizens have access to these technologies, and can take advantage of that access to empower and enrich their lives. This basic question of access is ultimately at the core of the issues surrounding ICT finance as well. As discussed above, backbone network infrastructures are being rather successfully deployed across the majority of territories, even in developing countries, by a combination of international private sector (profit-motivated) investment and targeted strategic development assistance. These same trends have succeeded in producing steadily increasing “penetration” indicators for national telecommunications operators for a long period of time, and in expanding the geographic scope of territory within nominal reach of major backbone network facilities.

²¹ “Telecommunications investors, financial institutions that provide telecom loans, and urban telecom operators are generally reluctant to involve themselves in rural operations because they see telecom ventures in rural areas, especially those in developing countries and emerging markets, as high-risk, low-return propositions. ... The provision of [support for] Rapid Market Appraisals may help to entice prospective operators into the market, while helping in the planning for optimised financial performance and long-term commercial viability. For example, in the case of Grameen Telecom, it was the feasibility studies initiated by Gonophone Bangladesh Ltd. and Grameen Bank that attracted external investment from a qualified foreign operator.” Caspary, Georg and David O’Connor (2003).



Source: ITU World Telecommunication Development Report, 2003

From 1997 to 2002, the total numbers of fixed telephone access lines in the lower and lower-middle income countries more than doubled to over 460-million. However, these investments generally did not fundamentally alter the basic economic challenge of providing network access to non-core locations, particularly rural areas, where large proportions of the population in developing countries live, and where the need for development resources is the greatest. In the lowest income countries in particular, telephone penetration outside of the largest cities typically remains around 1-2% or below, while it may reach 5-10% in urban areas.

The explosive growth of mobile telephone services in the developing world has also had a dramatic impact upon levels of both investment and telephone service access. There are now over 500-million mobile telephone subscribers in the 100 or so low and lower-middle income countries, compared with barely 30-million in 1997. In many of these countries, the total numbers of mobile phone users already exceed the total number of fixed telephone lines, after only a few years in service. This is especially true in lower income countries, where slow moving fixed-line penetration was quickly surpassed by the dynamic new mobile market. By 2003, African countries averaged some 6.0 mobile lines per 100 inhabitants, as compared with only 2.9 fixed lines. Moreover, the mobility and wireless signal coverage of cellular technology allows users to access the service in many more remote locations than are reached by the wireline networks.

Nevertheless, these favorable developments have not necessarily overcome the basic problems of rural telephone access. Signal coverage in rural areas is not sufficient to ensure that citizens with minimal incomes can afford to purchase mobile phones and pay for usage. More important, “access” to mobile telephone service in remote regions depends upon a variety of supporting conditions beyond the wireless backbone transmission network: electrical power for one, as well as commercial and technical support services, and appropriate financial systems, among other factors. In the absence of these components, access to mobile telephony remains largely dominated by the same base of urban, higher income user groups as traditional telephone service.

Meanwhile, as computers and the Internet have revolutionized worldwide communication, information, and commerce, increasing attention has been focused on the newest dimensions of the digital divide: the gap between those who are on-line and those who have virtually no foothold in cyberspace. This gap is far wider even than the telephone access gap: there were approximately 5-million Internet subscribers in the least developed countries as of 2002, compared with over 215-million in the most advanced economies. There are widespread concerns that the Internet may actually be deepening the disparities between information “haves” and “have-nots”. Providing Internet access in remote areas is significantly more challenging than establishing telephone service, not only due to the technical demands of data transmission networks, but because of the need for computers, software, Internet Service Provider services, and a host of support and training resources. New wireless data technologies may begin to cut into these disadvantages, but there remain serious impediments to achieving widespread rural access to Internet and other data and information services in developing countries.

Challenges: Tremendous progress has clearly been made in a short time in expanding access to ICTs, especially telephony. Still, it is evident that the market-based incentives which have driven growth in private sector financed ICT services for predominantly urban and higher income populations will confront more substantial obstacles to drive a similar burst of expansion beyond these regions and customer groups. From a business planning perspective, this is not surprising: demand for services in such areas is unproven, ability to pay is often minimal, network deployment costs are substantially higher in less dense locations. For many international investors, still recovering from drastic losses in speculative technology and license investments in their own countries, the prospect of pursuing questionable new ventures in low income countries is much less appealing than it seemed five years ago. And while potential domestic investors might see a more attractive opportunity to enter on the ground floor of untapped markets, they typically have even less access critical start-up capital and are consequently even more risk averse than international investors.

However, the market picture is not necessarily all that unfavorable. There are a variety of additional sources of potential revenue that could well raise the appeal of even very remote and low-income locales in the eyes of ICT service providers. As new access technologies begin to prove themselves, and steady growth in mobile and Internet markets in the developing world demonstrates the viability of these businesses, the prospects for enticing adventurous entrepreneurs and investors to launch new, speculative network operations in these countries, even in the most rural and economically deprived regions, is likely to brighten. From this perspective, the 50% or so of the world's population that does not yet have access to most basic or advanced ICT can be seen less as a "problem" than as a vast, untapped opportunity for continued market-based expansion.

Promising Practices: In response to these challenges, there has been a flood of access related programs and pilot projects throughout the developing world in recent years. Governments, donor agencies, NGOs, and others have experimented with village payphones, rural cellular service, public phone shops, and multipurpose telecenters or community multimedia centers, as vehicles to deliver communications capabilities to unserved populations. The financial mechanisms that have supported these projects are also diverse. They include:

- **Foreign Direct Investment:** As part of the package of market entry opportunities often granted to new foreign investors, whether mobile operators or fixed network strategic partners, license terms often include obligations for building out services in less attractive markets.
- **Telephone company internal funds:** Established operators with steady and profitable revenue streams may be able to allocate portions of their funds as seed money to expand network access to more remote areas, especially if there are tax, subsidy, or other incentives for doing so.
- **Universal Access Funds:** These funds can channel common industry resources and public financing toward expanding and stimulating market access.
- **Donor and IFI financing:** These outside financing sources can help supplement market and public funding, especially by targeting the gaps and risk margins inhibiting private investment.
- **Community and NGO investment and ownership:** Local communities and public service organizations can contribute to the cause of bringing access to themselves, through financial or in-kind investments, and partnerships with regional and national providers. Community ownership and control is potentially a powerful force in building out the network's 'first-mile' (a better term to describe the proposed approach than the usual 'last mile') to poor rural communities, especially deploying the new wave of wireless technologies. This is considered next. (*boxes 4.3.1 and 4.3.2*)

Box 4.3.1
Senegal's Private Telecentre Program

In Senegal, an initiative begun by the national telephone operator, Sonatel, to "outsource" the provision of public pay telephones, has blossomed into one of the most successful small business sectors in the country, and a model that is being emulated in other countries. Sonatel encourages private entrepreneurs to set up small local telecentres or phone shops, in which public customers can place telephone calls, and sometimes use computers, printers, and other facilities. Sonatel loosely manages the program by accepting applications and providing metering equipment and basic training to the telecentre operators. Telecentres charge customers premium (unregulated) to place phone calls, then remit approximately 70% of the payments to Sonatel. For some, which become formally affiliated with Sonatel, preferential wholesale tariffs are available. There are now over 250 such private telecentres throughout Senegal.

Box 4.3.2
Hungary's Telecottages

In Hungary, a different approach has yielded a similar boom in local communications access centers, known as “telecottages” (teleház). The telecottage movement began and continues as a community-driven initiative, where local civil society and NGO organizations have banded together to provide public access to ICT (telephone, computers, Internet) as well as many other traditional forms of information, from library books to bulletin boards. The program was launched by local activists, and gained financial support from the Hungarian government, NGOs, and international donors such as USAID. The telecottages are not yet wholly self-sustaining, generating about 30% of operating costs from local revenues, while public and donor sources make up the difference. On the other hand, there has been little instance of failure (less than 3%), in comparison with much higher failure rates for telecentre projects in other countries. This growing movement has spread not only throughout Hungary, where telecottages occupy at least 500 towns and villages, but to neighboring countries as well.

Contribution by Mátyás Gáspár, Hungarian Telecottage Association, Hungary; <http://www.telehaz.hu/>

*Community Ownership for the ‘First Mile’ in Poor Rural Areas*²²

As noted above, poor rural communities cost more to service with networks and have less to spend per capita. Current market incentives and traditional investment sources are unlikely to have a major impact there, at least for some time. Practices outlined above do help, yet a major shortfall still exists in relation, firstly, to developing the local level access (the ‘first inch’) where the infrastructure has already reached, but secondly and more acutely to building that ‘first mile’ which will link remote and poor communities to the nearest backbone access.

Thus many poor rural communities fall into a large gap in the current formula for telephony and ICT access: large-scale solutions to network infrastructure extension very often cannot reach far enough to enable the implementation of local solutions to the ‘first inch’. Bridging that distance between the local need and the nearest network infrastructure is often simply not profitable, in conventional terms, even based on pooling local demand. It is this bind – the gap in the conventional economics of the ‘first mile’ - which is keeping much of the world’s rural poor from access to telephony and to ICTs.

Now a new model is emerging, one based on community empowerment and ownership, principles long practiced in development activities generally but increasingly seen also in community-based ICTs applications-based initiatives (such as in Box 4.3.2²³). The new component (although it has a long history) is that communities are now taking the lead responsibility, often with public authorities and private partners, in initiating, designing, resources and managing network solutions. Innovative technologies can play a vital role, especially since they reduce the per-connection investment needed even for a small number of users, are low-maintenance and can be incrementally extended. The new formula is thus local solutions for *both* network extension *and* service provision (and indeed applications and content development), combined with a realistic business plan and an empowering, development oriented, ethos. Different configurations are emerging in different areas, according to circumstances, some pursuing a locally-owned cooperative model, others building partnerships.

The community-owned rural telephony cooperative has a very long history. In the US some 6,000 rural telephone cooperatives were in existence by 1927, and 1,000 still operate most now delivering broadband. From the 1960s and 1970s, cooperatives emerged in Argentina and Bolivia and later in Poland and Peru, often associated with other rural infrastructure enterprises (as in Huaral, Peru where the telecom network is being operated by the valley's irrigation association; and in the US where the cooperative often provide electricity and water services), and are thriving. They have many strengths over the for-profit model.

²² This section draws on the draft of the report by Seán Ó Siochrú & Bruce Girard “Innovative Technologies and Community Ownership: A New Model of ICT Access for the Rural Poor”, commissioned as a contribution to the work of the Task Force on Financial Mechanisms. Case studies under development include reviews of initiatives in Argentina, India, Poland, Peru and South Africa amongst others.

²³ Increasingly, community ownership is seen as central to success in local ICT applications initiatives. See for instance Ballantyne, Peter (2003) *Ownership and Partnership: Keys to Sustaining ICT-enabled Development Activities*, IICD, Netherlands. <http://www.iicd.org/iicd/articles/IICDnews.import2286> and Cecchini, Simone and Christopher Scott, (2003) *Can Information and Communications Technology Applications Contribute to Poverty Reduction? Lessons from Rural India*. April. http://www.developmentgateway.org/download/181634/cecchini_scott_ICT.pdf

Box 4.3.3

Cooperative Networks in Poland

In Poland in 1991, two pioneering local cooperative networks, WIST and Tyczyn, were joined by numerous private-investment local networks, which meant they were directly comparable. However, many of the private networks found that they could not offer the level of return demanded by their investors and were forced to sell, sometimes at a loss, to the national telecoms provider. According to a comprehensive review in 2003:

"Unlike investor owned companies, [the cooperatives] were able to build out their systems, pay off their loans rapidly, and prosper while many investor-owned systems - dependent on outside capital and profit, rather than service as their motivation – have been less successful or failed. A critical element in the success was their community ownership. (NTCA 2003 p14)

Both cooperatives grew by means of both extending into unserved areas and poaching customers from the state provider TPSA using incentives such as immediate repairs as against the weeks or months it took TPSA. The cooperatives also boosted revenues and clients through household enterprises, farm processing and businesses attracted business relocating into the service area, underlining the importance of a good quality, reasonably priced and responsive system to business development. The cooperative are credited with having given a major boost to business as a whole.

But the spin-off benefits were also important.

"The projects proved the importance of telecommunications for community strengthening and local economic development. In both cases, their success resulted in the formation of relationships among local mayors and *gminas* [county] that lead to other important public services, including wastewater treatment and household natural gas networks. The cooperatives spurred enterprise development, helped in the formation and success of a credit union and large dairy cooperative. (p15)"

Source: Adapted from case study on the cooperatives,

http://www.ntca.org/ka/ka-3.cfm?content_item_id=1599&folder_id=324 and

<http://www.coopdevelopmentcenter.coop/CDP%20case%20studies/NTCA%20Case%20Study.pdf>

Leveraging local resources at no cost and reinvesting all profits back into the community have allowed them, in Poland, to offer lower tariffs than for-profit operators and a higher level of service. With the emergence of more sophisticated content-driven services, the direct link to local needs is also more likely to yield viable and sustainable services, in turn generating further income. Sometimes more important to the communities is that such cooperative usually engage in wider community development activities, and have reinvigorated local economies. And experience in Poland and elsewhere shows that the minimum return on investment required is less for the cooperative model, and that sustained periods of limited income can be weathered more easily – it can thus potentially reach further into rural marginal areas.

In India, another model of community network control has emerged through the empowerment approach to local development, building partnerships with a very distinct flavour. While the public telecoms operator and the private entrepreneur may play a vital role, the local community stays in the driving seat in terms of the determination of needs, the terms and nature of service, affordability and in bestowing additional community benefits. The Akshaya experience (Box 4.3.3) has proven to be highly replicable and brings the 'first mile' via a public operator and more recently WiFi to over 600 information kiosk offering community-driven ICT services. Another example in India, the N-Logue project, was initiated by the Institute of Technology

in Madras, combines a social enterprise model with local enterprise and has connected hundreds of villages previously lacking network access across seven states with, in effect, an internet café and phone booth access. Community network solutions, driven by local needs, can be found elsewhere too. In Laos,²⁴ the demand for a network had arisen directly as a result of other development activities of the villagers, which gave rise to a need for specific services including both telephony and internet

²⁴ See Community-Owned Wifi/VoIP Network in Laos. http://www.jhai.org/jhai_remote_launch_follow.htm

access. And the myriad local informal WiFi networks springing up through Indonesia can be seen as an expression of the same process.

Box 4.3.4
The Akshaya Initiative

The Akshaya experience in India an interesting hybrid: a determining level of community control is exerted in the context of a state government programme that offers franchises to private entrepreneurs and local entities. The Kerala State programme now extends to over 600 information kiosks, offering a range of ICT services beyond telephony, such as bill payment, registration of complains at police stations, and birth and death registration. The state provides the connectivity, and is in fact currently testing WiFi based connectivity for its rural kiosks.

This goes well beyond a case of harnessing a local entrepreneur in a poor area. A vital factor is that the local elected village bodies, the Panchayati Raj Institutions (PRIs), have a major legally-sanctioned role in governing these. In addition to a policy that all franchisees train at least one member of every family in the use of ICTs, the PRI has a strong voice in who is selected and supervising the franchisee. These can and are used to set affordable tariffs for the poor, to ensure that profits are proportionate to the role played by the franchisee, and that excess goes to community purposes, in selecting the range of services.

Community-ownership is not a panacea for the ‘first mile’ to poor rural communities. But the combination of self-help, needs driven, non-profit enterprise, often in collaborations suitable to the country or region, with innovative low-cost, incrementally expandable technologies, has the potential to make a significant difference. There is strong evidence that community-owned and driven initiatives can extend networks further into rural and poor areas, can provide better services at lower cost, and can link more effectively link into other development and empowerment activities in these areas. They build upwards from recognized demand for specific applications, as distinct from a general desire to roll out a network, and can leverage community resources. They can also mean, in terms of the economics of network provision, that a rural network of no interest to an external investor is feasible for the community themselves to undertake.

The path ahead: When it comes to seeking financial support for extending access networks, facilities, and services for rural and low income populations, all available resources should contribute. This is not an “either-or” choice between market-based private sector solutions and public or donor financed subsidies. Current models of access economics define a theoretical threshold between the “market efficiency gaps”, which are caused by artificial barriers in the market and “true access gaps” which result from fundamental cost and demand conditions, and requires subsidy and other mechanisms to resolve. In practice, the boundary between these conditions is often difficult to identify with precision, and changing industry dynamics and market realities will constantly shift the target on a region-by-region basis. Furthermore, a bottom-up community-driven approach outlined above can considerably reduce the level of the “true access gap”, making access to many poor rural communities viable. Public finance and donor assistance should work hand-in-hand with market-based mechanisms to accelerate access network investment, in the context of enabling policies and other incentives. Key features of such an integrated strategy should include:

- **Market opportunity:** Outdated licensing and market access barriers which restrict even investors willing to construct new facilities in currently unserved areas, need to be eliminated, and other policy initiatives – such as access to frequencies and rights of way, minimal taxes and fees, etc. – should be designed to maximize the incentives for new entrants.
- **Market risk:** Financial institutions and governments should work with potential investors to mitigate perceived risk levels as much as possible. This involves working with and reforming financial markets, guaranteeing low-interest loans, enforcing contracts and business practices laws, working to stabilize currencies and inflation, and ensuring full disclosure of relevant market information.
- **Funding resources:** Subsidy and seed financing from private, public, and outside sources should be channeled to support investment in uneconomic unprofitable and risky projects which will benefit the ICT sector as a whole and development priorities. Such resources could usefully be coordinated through a central implementation source such as

a Universal Access Fund, with transparent and equitable criteria for distributing funds among competing sector participants and target locations.

- Community-driven solutions: Community-driven ‘first mile’ solutions, as cooperatives or in community-controlled partnerships, can leverage considerable local resources and render networks to poor rural communities more viable. These should be examined with a view to determining the optimal regulatory, funding, capacity-building and institutional requirements.
- Public and institutional coordination: ICT access projects should be planned and coordinated together with other public infrastructure and networking initiatives to maximize efficiency and aggregate market demand. E-government and e-governance programs should be closely linked to universal access rollouts, utilizing common facilities to permit integrated public and private networks to be delivered on a commercially viable basis.