by Heather E Hudson

Defining Universal Service Funds

Are they accelerators or anachronisms?

Access to telecommunications services has improved dramatically in the developing world in the past decade, but there are still gaps in areas that have no telecommunications services ("unserved") or where service is unreliable, intermittent, or in some cases, unaffordable to many residents ("underserved"). As mobile networks have expanded to cover low income urban neighborhoods and further into rural areas in many countries, the attention has shifted to providing Internet access, and/or some form of broadband.

The means of financing expansion of services to high cost and/or low income regions traditionally was cross-subsidies, typically internal cross subsidies from high margin services. Typically a regulator would designate regions to be served or QOS targets to be met as a condition of granting or renewing a license, and would authorize tariffs designed to generate revenue from services such as international calls or domestic long distance that could be then directed to subsidizing expansion of or rates for services in other areas.

However, with the introduction of competition, subsidies had to become explicit, so that providers could not use revenues from still-monopoly services to competitive ones to drive out competitors. Funds for such subsidies could come from government budgets, but to avoid relying on governments, funds were set up to channel some revenue from all the carriers (or all in a certain category) into a fund for redistribution as subsidies to address universal service or access.

The first USFs were established in the mid 1990s in Latin America (Colombia and Peru, 1994; Chile and Mexico, 1995; Guatemala, 1996). Among industrialized countries, the U.S. expanded its universal service subsidies to include “advanced services” for schools and libraries in the Telecommunications Act of 1996. In Africa, the first USF

<table>
<thead>
<tr>
<th>Regions</th>
<th>Countries</th>
<th>Percentages</th>
</tr>
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<tbody>
<tr>
<td>North America</td>
<td>2</td>
<td>3.8</td>
</tr>
<tr>
<td>Europe</td>
<td>7</td>
<td>13.5</td>
</tr>
<tr>
<td>Latin America/Caribbean</td>
<td>15</td>
<td>28.8</td>
</tr>
<tr>
<td>Africa</td>
<td>15</td>
<td>28.8</td>
</tr>
<tr>
<td>Asia/Middle East/Oceania</td>
<td>13</td>
<td>25.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 1 Countries with Universal Service Funds

<table>
<thead>
<tr>
<th>Fund Administrator</th>
<th>Countries</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulator</td>
<td>31</td>
<td>59.6</td>
</tr>
<tr>
<td>Ministry</td>
<td>7</td>
<td>13.5</td>
</tr>
<tr>
<td>Independent Agency</td>
<td>10</td>
<td>19.2</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>7.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>52</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Table 2 Universal Service Fund administration
was established in South Africa in 1998. By 2009, at least 52 countries had established a form of universal service fund. Most were in the developing world. See Table 1.

Funding Sources
Levies on operators are the main sources of funding, ranging from 0.04 percent of revenues in Estonia to 5 percent in Colombia and India, and 6 percent on certain services in Malaysia (see Figure 1). Some 22 countries have levies ranging from 1 percent to 2 percent of revenues, although there are variations in the definition of the revenue base. Most now require contributions from both fixed and mobile operators; a few such as Peru include cable TV operators; Nepal includes ISPs; while Uganda also assesses ISPs, the postal service, and couriers. Government contributions were used initially in Chile; Guatemala also started with government funds, supplemented with revenues from spectrum options Colombia adds license fees to operator levies. Jamaica places a levy on all incoming international traffic ($0.03 per minute on traffic terminating on the fixed network, and $0.02 per minute on traffic terminating on the mobile network). In some cases, governments or international development agencies contributed seed funding. Seed funding presents “... a mechanism for government, or donors such as the World Bank, to contribute financially to universal access and service (UAS) in a liberalized market, without getting directly involved in less-efficient forms of project ownership or management, as in the monopoly era. This has resulted in a considerable amount of seed finance being contributed before the build-up of equity through operator contributions in some smaller markets.” For example, initially in Chile, the government contributed the whole amount without any levy on carriers. The World Bank has made initial contributions to universal service funds in Uganda, Mongolia, and Tanzania.

Fund Management
The majority of funds, some 60 percent, are administered by the regulator, or at least are the regulator’s direct responsibility. About 20 percent are administered by an independent agency, although the actual independence may vary, depending on its autonomy and membership (see discussion below). About 14 percent are

Figure 1: Existing or planned UASF Operator Levies
Source: ITU-InfoDev ICT Regulation Toolkit – Universal Access Module
administered directly by a ministry (typically a ministry of communications). See Table 2.

Changing Goals & Definitions

When the first universal service funds were established in developing countries in the mid 1990s, teledensity (at that time, generally fixed lines per 100 inhabitants) was very low, and in most rural and isolated areas, telephone service was non-existent.

With the introduction of competition in mobile services in developing countries during the past decade, access to voice telephony has increased exponentially: “The first billion telephone subscriptions, reached by the end of 1997, took more than a century to accomplish. It took just four years to add the second billion, three years for the third billion and two years for the fourth billion.” In 1997, the teledensity for low income countries was just 1.5 subscriptions per 100 inhabitants; by 2007, teledensity had increased to 23.9 per 100 inhabitants, of which more than 95 percent were mobile subscribers (some with multiple subscriptions or SIM cards).

The OECD estimates that between 1996 and 2006 annual investment in telecommunication infrastructure more than doubled in low income countries, from $4.4 billion to $9.6 billion per annum, while equipment costs were falling and network infrastructure was shifting to less expensive wireless-based systems. Thus, by the time most universal service funds were established or ready to distribute funds, requirements had changed. There were still rural and remote regions without any public phones or wireless coverage, but access had increased dramatically. Funding was still needed to reach some rural areas where projected costs were too high and revenues too low to attract private investment, but a new gap or “digital divide” had emerged in disparities in access to the Internet.

Changes in criteria for universal service funds include:

- **Fixed to mobile**: Funds began by distributing funds primarily or exclusively to fixed line operators. Now funds generally also support mobile operators to extend coverage to unserved regions or to improve coverage, not only because it tends to be cheaper but because mobile is no longer considered a luxury, but the first and only phone for the majority of users in the developing world.

- **Narrowband to broadband**: As the Internet has become increasingly important as a platform for commercial and development services and a means to enhance education and improve health care and other social services, universal service funds have begun to provide funding for Internet connectivity, including broadband.

- **Service vs. Access**: Some countries still specify that public phones must be provided – in every community or neighborhood of a certain size, or within a short distance of most residents. However, for voice service, most residents in covered areas now own or share a mobile phone. Community access has now become the criterion for Internet services, facilities such as telecentres, libraries, Internet cafes or other public facilities.

Thus, while universal service funds generally prioritize coverage for regions and/or populations without access to voice telephony (traditionally provided over fixed lines and public pay phones), many countries are now expanding definitions to include mobile telephony and Internet access. For example:

- **Chile**: The government has expanded support to extend basic telecommunications to rural and low-income areas to include telecentre and backbone projects. The Fund has launched a national telecentres program, plans to provide connectivity for microenterprises and SMEs to help improve productivity, and to finance a fiber optic backbone extension project.

- **Ghana**: Funds are disbursed to aid in the provision of rural telecentres, as well as for public telephony and Internet POPs (points of presence).

- **India**: The USO Fund was originally used to set up village community phones. It was expanded in 2005 to include individual lines in rural areas, and in 2007, to include both mobile service and fiber optic backbone network in rural areas.

- **Mongolia**: The Fund plans to support a range of initiatives aimed at extending access to telephony and Internet services in rural regions including some mobile telephony, satellite-based public telephony, Competitive voice and data services through wireless access points, Internet public access centers, Internet in schools.

- **Morocco**: The fund’s priorities are rural public telephony, installation of community Internet centers, and expansion of broadband capacity.

- **Nicaragua**: In 2007, Nicaragua committed to investing US$ 10 million to expand fixed telephony and Internet services to 103 municipalities in rural areas.

- **Nigeria**: The fund’s initial focus is on community communications centers and mobile network expansion.

- **Paraguay**: Projects supported include payphones, Internet access for schools and a nation-wide emergency calling system.

- **Romania**: From 2004 to 2006, the regulator held tenders for the installation of telecentres in 331 localities.
South Africa: Initially supporting telecentres and public payphones, the USF now also includes E-school cyberlabs, ICT telecontainers and community digital hubs.

Vietnam: Funding is to provide public phones for 90 percent of communes in designated areas and Internet access for 30 percent of communes in these areas.

Institutional access

Some countries include support for public sector institutions that would make Internet services available to the public, such as post offices and libraries, and schools that would make facilities available to the public as well as to students. Internet access for schools in general (without necessarily including public access) is subsidized by universal service funds in several countries including Afghanistan, Chile, Colombia, Macedonia, Malaysia, Mongolia, Paraguay, South Africa, Uganda and the United States.

In the US, the E-Rate (short for “education rate”) created by the Telecommunications Act of 1996 provides discounts on a wide variety of telecommunications, Internet access and internal connections for schools and libraries. The applicable discount rate is based on a school’s economic need and whether it is located in an urban or rural area. Up to $2.25 billion worth of discounts can be made available each year.

Approved schools and libraries post their requirements online, where they are open for competitive bids. If no competitors respond during the designated time period, the school or library may contract with the local incumbent operator. The result in many small communities has been that the school has become an anchor tenant for Internet access.

In Alaska, the E-Rate subsidy had brought Internet access to village schools. One of the competitive providers found the school subsidy critical to its business case to bring broadband to the villages (primarily by satellite), and has then installed broadband wireless to cover the villages, with price for individual access not to exceed the price in Anchorage, the largest city. Connectivity for rural health services is also supported from universal service funds in the U.S. In Alaska, where native people live in more than 200 isolated villages, most without road access, the AFHCAN (Alaska Federal Health Care Access Network) program relies on this subsidy to connect more than 250 sites, including links between more than 150 village clinics and regional hospitals.

Allocating funds

Traditionally, governments through their own budgets or USF resources have identified unserved regions and provided subsidies to incumbents or "carriers of last resort" to extend facilities and in some cases to subsidize prices if these areas are considered unprofitable. Although this approach can accomplish universal service goals, it has several potential flaws.

Typically, the incumbent or designated operator has no incentive to be efficient or innovative in its choice of technology and its installation and maintenance if these costs are directly subsidized. Second, the operator may have no incentive to maintain adequate quality of service (QOS) if it assumes these areas are unlikely to generate significant revenue. And third, the operator may demand special treatment or concessions in a liberalized environment because of its universal service obligations.

An alternative approach that has been used in several countries to create incentives for efficient investment in rural areas is the reverse auction, a form of “smart subsidy.” Opportunities to install and operate facilities in designated unserved or underserved areas are put to competitive bid. The operator which requests the lowest subsidy wins the right to serve the territory. Terms may include performance by specific roll-out dates, maintenance of approved QOS, and multiyear licenses (in some cases with exclusivity for a specified period). Chile’s success with reverse auctions is the best known example.

Chile’s Telecommunications Development Fund was created in 1994. Regional and local governments submitted requests for payphones to the regulator, which determined maximum allowable subsidy. Any firm could bid, and the winner got a 30 year license. The resulting average subsidy was $3600 per payphone, compared to estimated costs of $10,000 to $20,000. Chile managed to cover 66 percent of designated villages using only 54 percent of financing available; 656 villages required no subsidy. Other countries using a form of reverse auction or minimum subsidy tender include Colombia, Guatemala, India, Nepal, Paraguay, Peru, Romania, Venezuela and Uganda. In Uganda, for the telephony component, the total project costs for all three regions was estimated at about US$ 11.7 million, while the total subsidy awarded was US$ 5.2 million.
Table 3: Where the money stayed

<table>
<thead>
<tr>
<th>Countries</th>
<th>Percentage disbursed</th>
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<tbody>
<tr>
<td>15 developing countries* total</td>
<td>26</td>
</tr>
<tr>
<td>13 Latin American countries**</td>
<td></td>
</tr>
<tr>
<td>6 countries</td>
<td>0</td>
</tr>
<tr>
<td>4 countries</td>
<td>16 to 43</td>
</tr>
<tr>
<td>3 countries</td>
<td>More than 95</td>
</tr>
</tbody>
</table>

*Countries (global): Bolivia, Brazil, Chile, Colombia, Dominican Republic, Guatemala, India, Indonesia, Malaysia, Nicaragua, Pakistan, Peru, South Africa, Uganda, Vietnam

**Latin American countries: Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Paraguay, Peru, Venezuela

The money went - or stayed

In 2006, Regulatek published a study of universal service policies in Latin America that identified 13 countries with universal service funds. The amounts collected ranged from about $1 million (Ecuador) to $1.8 billion (Brazil). Of these, 6 countries (or 46 percent) had disbursed 0 percent of the funds collected. Only 3 countries (Chile, Mexico and Paraguay) had disbursed more than 95 percent, and the others’ disbursements ranged from 16 percent to 43 percent of the funds collected. A review of 15 operational funds in developing countries around the world in 2007 found that they had collected a total of approximately $6.2 billion from operators. The largest funds were in India and Brazil. Some 78 percent of the total collections ($4.8 billion) came from two countries (India and Brazil), 9 percent ($548 million) from Malaysia, and 2 percent ($111 million) from Peru, while funds in the remaining 12 countries totaled less than 12 percent ($725 million). An additional $62.8 million was contributed by governments and international donors, but primarily in only 3 countries: government in Chile and Colombia, and the World Bank in Uganda. By 2006, these 15 funds had disbursed just 26 percent of the total collected. See Table 3. Of the $1.62 billion representing 26 percent of the funds collected, most was still being distributed to fixed line operators. See Figure 2.

Key Lessons

The following key lessons can be derived from experience to date with universal service funds:

- **Management:** The organizational structure of the fund within the government can affect the efficiency and transparency of fund operations. Funds administered by or under a ministry are likely to be more prone to bureaucratic inefficiency and possible political influence than those under a regulator or established as an autonomous entity.

- **Professional capacity:** Fund management requires expertise in operations, finance, accounting, current technologies, and contracting and other legal matters. Some of the fund’s tasks may be outsourced to government departments or independent contractors, but key functions should be the responsibility of fund staff.

- **Appropriate size of fund:** The amount collected should be adjusted to meet realistic and achievable goals, and to take into consideration the capacity of the staff to manage and monitor distribution of funds. As noted above, some countries (such as Brazil, India and Malaysia) have collected far more revenues than they can redistribute.

- **Including mobile:** Early fund criteria emphasized or required investment in fixed wireline networks to increase teledensity. Most now recognize that mobile wireless is much more cost effective in increasing access to basic telephony, particularly in exurban and rural areas.

- **Broadening mandates:** Funds may also need to shift priorities as voice service becomes almost universally available, primarily through wireless mobile networks. Many funds now include some form of Internet access, through increasing available bandwidth and/or supporting public access through telecentres, Internet cafes and other entrepreneurs, libraries, post offices, schools, etc.

- **Smart subsidies?** Some analysts recommend that funds be allocated exclusively for "smart subsidies," defined as "a once-only incentive that is designed to be results-oriented, and does not distort the market or add to the burden of operators in the sector in the long run." However, some services, such as Internet for schools or libraries, may require ongoing subsidies, as is done through the U.S. E-rate program.

- **Serving the public interest:** Many elements are necessary to ensure that the fund serves the public interest — both in implementation and in process. Objectives should be clear, there should be consultation with all the stakeholders including major operators, new providers, and users, particularly target groups such as rural residents, students and teachers, social service providers and NGOs. And access must be defined for local conditions — to include both availability and affordability.

- **Using incentives:** The process of allocating funds should foster innovation — in technology, in operation of services, in applications. It also should reward efficiency and quality of service (QoS). Incentive-based funding also requires that tenders are open to all qualified providers, not just to incumbents. In Malaysia, the author found that funds were available only to incumbents, and if they chose not to apply for available subsidies, innovative entrepreneurial providers would not be considered. As a result, villages in remote
areas of Sarawak remained without voice and Internet access, despite the availability of unspent millions of dollars in the fund.19

**Technological neutrality:** Unfortunately, funds often prepare tenders with specific technologies in mind. Requirements should specify coverage, bandwidth, QoS, target price etc. but not technology. Voice service can be provided by wireless as well as wireline technologies; Internet access can be delivered by various forms of licensed and unlicensed wireless, as well as over DSL, fiber, cable, and satellite – still an important option in isolated areas, mountainous regions, and islands.

**Financial independence and transparency:** Universal service funds need separate accounting systems and accounts that can be monitored and audited, and remain distinct from other government accounts. If such separation is not maintained, funds may be appropriated for other purposes, as happened all too often with operator revenues in the era of public sector monopolies in developing countries.

**Monitoring and Evaluation:** Funds must ensure that projects they support are monitored for implementation as specified, and for ongoing QOS. The funds themselves should be subject to regular review (e.g. every 3 to 5 years) to ascertain how revenues have been distributed, what increases in access have been achieved, and what impact the investments have had on usage in previously unserved and underserved areas, and the developmental impact of such usage. Ideally, funds should be subject to sunset provisions, so that if the review determines that the fund has been seriously mismanaged or is no longer needed, it can be disbanded and funds can be rebated to subscribers or used for related purposes.

**Conclusion**

Properly designed and implemented, universal service funds can accelerate investment in unserved and underserved regions, and can stimulate innovative technological solutions. Yet there are many potential pitfalls: criteria that favor incumbents or dictate technologies, overly cumbersome procedures, and staff who don’t have the expertise or autonomy to manage the fund can be reminiscent of the worst of public sector monopolies – anachronisms rather than incentive-based accelerators.

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**Notes:**

1 Based on information available from the ITU, the ICT Regulators Toolkit (InfoDev) and Stern, Peter A. and David Townsend, “New Models for Universal Access in Latin America.” Regulatel/World Bank, August 2006.
4 The author is a consultant on a World Bank project helping to establish a universal service and access fund in Tanzania.
6 Paltridge, OECD, 2009. Data derived from the ITU and UNCTAD.
17 ICT Regulators Toolkit, Section 3.2.4: Performance of Funds to Date. See www.ictruligiontoolkit.org/en/Section.3180.html#oneRone
19 Field visit to Bario, Sarawak by the author in December 2006.