# CHAPTER 6. FROM AVAILABILITY TO USE: UNIVERSAL ACCESS AND SERVICE

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## 6.1. Introduction

Chapter 6 examines approaches to universal access and identifies global best practice. The chapter begins by underscoring the policy rationale for universal access and the need for intervention. It identifies the main access gaps and the scope of services to be considered. Different types of universal service regimes are described, including subsidies made available through universal service funds. The discussion takes into account the changing technological context, the pressures for reform and specific strategies for developing countries. It also highlights issues such as digital literacy and accessibility, which are seen as vital elements for moving beyond the mere availability of networks to their widespread adoption and use.

## 6.2. Trends and Approaches

Universal access and service has seen massive change prompted by privatization and liberalization of telecommunications in the developed world, and by innovative approaches employed by developing countries. The latter were faced with different challenges to achieve universal access and service (UAS), and in response developed new UAS models. Market liberalization and sector reform has not only changed the communications landscape dramatically, but has also resulted in innovative ways to promote and achieve UAS throughout the world. With a new service revolution looming – the broadband revolution –UAS will likely see another major shift in UAS models and approaches.

### 6.2.1. Definitions

The concepts of universal service (US) and universal access (UA) are distinct. US refers to service at the individual or household level, e.g., typically a telephone in each home. UA refers to a publicly shared level of service, e.g., through public payphones or Internet telecenters.

However, in more and more countries UA and US apply at the same time, and it therefore makes sense to use the generic term universal access and service (UAS). For example, in the past, developing

countries typically focused primarily on UA as that was the appropriate and most feasible target. However, since the maturation of mobile communications, which extended services further and lowered access barriers to take up, many developing countries may now also realistically target US for telephony, at least in many urban areas. At the same time their goal for the Internet is UA. Thus, their policy is no longer solely focused on UA but on both UA and US.

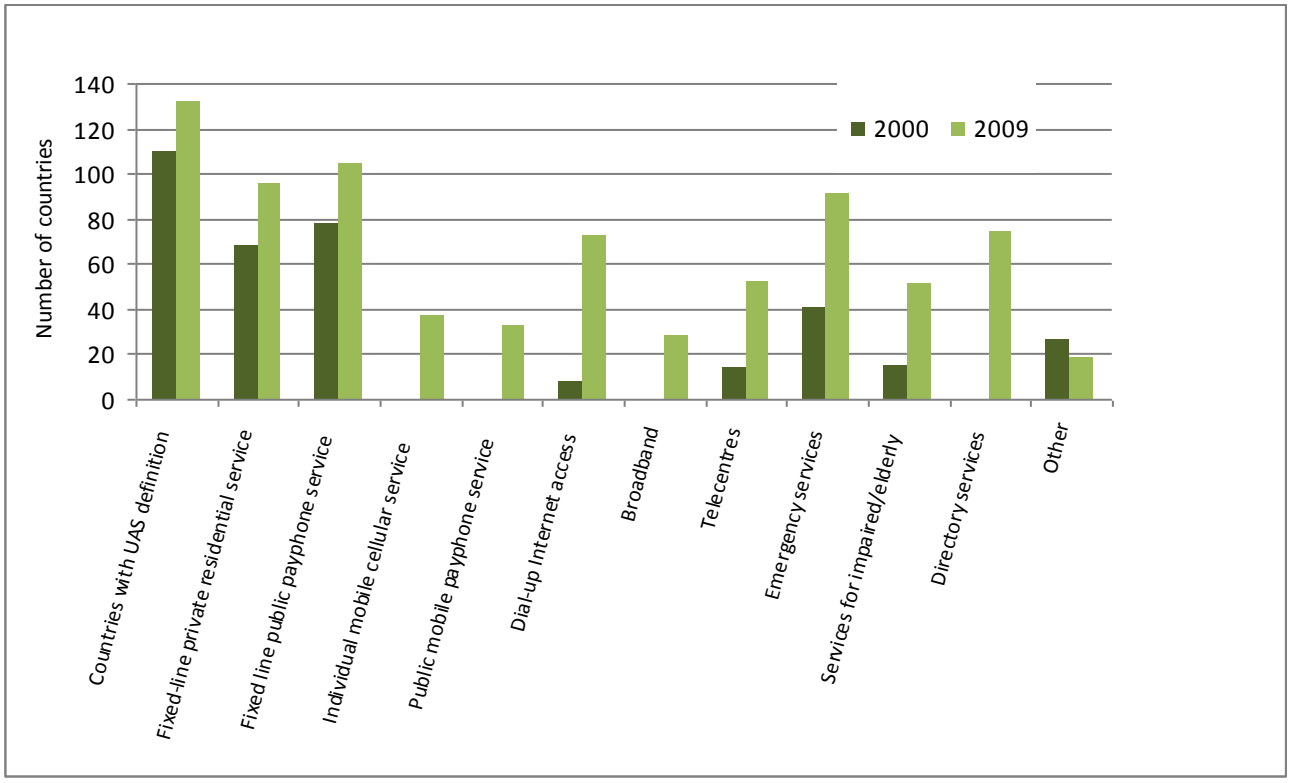
In the more developed world, which previously had only US policy goals, the onset of broadband has led to a redefinition of the term UA, i.e. the goal is universal access to broadband availability and affordability. It is often recognized that universal availability of broadband services may not necessarily yield universal service-like household penetration, though the provision of affordable access is an important goal.

As can be seen from in Figure 6.1, UAS policies and strategies go beyond telephony, and include at least data and Internet communications. Now policies increasingly look towards broadband communication.

Traditionally, broadcasting has not been a part of UAS, but is now regarded as part of ICTs, in particular as the underlying technologies and delivery mechanism for telecommunications and broadcasting are converging. However, media laws and policies have fundamentally different requirements, which go beyond affordable access and service, such as diversity and quality of content, pluralism and independent news reporting, etc. As a consequence, developing UAS requirements for broadcasting will break new ground.

Increasingly, UAS policy needs to be as forward-looking as possible and include broadband developments, the move towards a next-generation network (NGN) environment, and should address issues of convergence. The future challenges for policymakers are how to address the increased requirements and complexities of UAS while at the same time having UAS policies and programs that achieve their goals quickly and efficiently.

***Figure 6.1 Universal Access/Service Definition, 2000-2009***




Source: ITU World Telecommunication/ICT Indicators Database

### 6.2.2. Approaches

Widespread access to and diffusion of ICTs are highly desirable for social and economic reasons. Ensuring the full participation of all in the Information Society is a major policy goal, the implementation of which brings all the benefits and transformational opportunities of ICTs. For example, countries participating in WSIS set the ambitious goal of connecting all villages of the world to ICTs by 2015, including establishing community access points, and connecting universities, schools, libraries, post offices, health centers, and local governments. The EU has adopted the term "e-inclusion" to refer to full access and participation and is particularly conscious of the promises of new digital opportunities and the new risks of digital exclusion.

The WSIS target is one for universal access, which is appropriate for developing countries at this time. But as markets and technology unfold, the bar will continue to be set higher. This implies a periodic reconsideration of what types of service should be included in any definition of UAS (ranging from single line voice-grade, incrementally all the way to two-way broadband services) and at what cost to the consumer. Flowing from these issues are the mechanisms for both delivering and financing the desired level of service.

Consequently, in recent years experience has been accumulating in using different approaches in pursuit of UAS, including:

- Market based reforms
- Mandatory service obligations
- Leveraging new technologies, e.g., mobile
- Leveraging new business practices, e.g., pre-paid cards
- Cross subsidies
- Access deficit charges
- Universal Funds
- Public-private partnerships

## 6.3. Policy Rationale

### 6.3.1. Concepts and Definition

For ICTs, universal access (UA) and universal service (US) can largely be characterized by the availability, accessibility and affordability of telephony and the Internet, with increasing consideration of the inclusion of broadband and broadcasting.

The following definitions are used:

- Universal access (UA): ubiquitous access to the service e.g., at a public place, thus also called public, community or shared access.
- Universal service (US): every individual or household can have service, using it privately e.g., either at home or increasingly carried with the individual through wireless devices such as mobile phones or PDAs.
- Universal access and service (UAS): the generic term when referring to both UA and US or the general concept.

The three hallmarks of UA and US are:

- Availability: the service is available to inhabited parts of the country through public, community, shared or personal devices;
- Accessibility: all citizens can use the service, regardless of location, gender, disabilities and other personal characteristics; and
- Affordability: the service is affordable to all citizens.

These three aspects are relevant to both UA and US, but in different ways and to different degrees. Table 6.1 illustrates UA/US similarities and differences.

The following concepts are the steps in the progression of UA to US:

- Universal access: every person has affordable and reasonable public access to defined ICT services considered essential for social inclusion and economic development;
- Universal geographic coverage: 100 per cent of the population can obtain a defined ICT service provided that the user has the ability to pay for the service; and
- Universal service: 100 per cent of individuals or households can afford ICT services categorized as part of US, and a majority of the population subscribes to these services.

The concepts of UA and US are applicable to the following ICT services:

- Telephony (voice calls and text messages);
- Narrowband and broadband Internet;
- Radio and television broadcasting.

***Table 6.1 Characteristics of Universal Access and Universal Service***

| ASPECT | UNIVERSAL ACCESS | UNIVERSAL SERVICE |
|---|---|---|
| **Availability** | *Focused coverage* | *Blanket coverage* |
| | *Public access (e.g., at a payphone or telecenter)* | *Private service on demand* |
| | *Free emergency calls* | *Free emergency calls* |
| **Accessibility** | *Walking distance, convenient locations and hours* | *Simple and speedy subscription* |
| | Inclusively designed premises (e.g., for wheelchair users); inclusively designed terminals or available assistance (e.g., for the blind or deaf) | Inclusively designed terminals and services (e.g., for blind or deaf people) |
| | Assistance from an attendant | Assistance through the terminal (e.g., by making calls or viewing help pages for the web) |
| | Adequate quality of service (e.g., having few failed call attempts) | Reasonable quality of service (e.g., having few dropped calls) |
| **Affordability** | Options of cash and card payment | Cost of average monthly usage is a small percentage of monthly GNI per capita |
| | Options of cash and card payment | Options of cash, card and electronic payment |
| | Payment per use (e.g., for a single call or message or an hour of Internet access) | Flat rate, bundles of services or low monthly subscription fee |

Note: Essential characteristics are in italics, while desirable characteristics are not.

While broadcasting has traditionally not been a part of UAS policies, it is increasingly being considered due to the convergence of technologies and triple-play offers by service providers (e.g., cable TV operators that also provide telephone and Internet services). UAS policies that include broadcasting are emerging. This is especially the case in countries that have adopted a multi-sector regulator overseeing both telecommunications and broadcasting.

### 6.3.2. Rationale

ICTs are present in all sectors of the economy and are recognized as a pillar of modern society. No sector seems to work efficiently without them. Diverse sectors such as governance, education, health, business, finance and tourism are critically dependent upon information and communications. All countries, irrespective of economic status, must recognize the trend towards ubiquitous use of ICTs. This is why the term enabler is often used to describe ICTs.

The main arguments for a universal access and service (UAS) policy are the following:

- ICTs are social and economic enablers. ICTs are increasingly used in all sectors of economies. In many regions, economic activity is shifting away from agriculture and industry to services sectors and towards the new information economy and society. The ICT sector is considered to be a significant engine of growth for economies. Also, on the social side, ICTs facilitate many functions and improvements, including e-governance, distance education, e-health and database sharing across social service agencies.
- Supply and demand increases the importance of UAS policy. The increased supply of ICTs through rapid technological developments fuels the requirement for universal access (UA). Mobile phones, not too long ago considered luxury items, now provide the main access to voice service for the majority of people in many countries, making it more urgent that the population without access be provided with access to phone service. Similarly, for large parts of the population, work and life without the Internet is unthinkable, and ever more megabyte-rich applications will require increased broadband development. The more ICTs are used, the more there is a dependence upon them, which in turn makes it more essential that all citizens have access to ICTs.
- Market gaps can remain in place. While it has been demonstrated that market forces, after liberalization and sector reform, have had the greatest impact on improvement of UAS in many developing countries, for various reasons market gaps may remain in place. Some countries, for example, have exceptionally challenging geographic characteristics combined with extremely low population densities (e.g.,

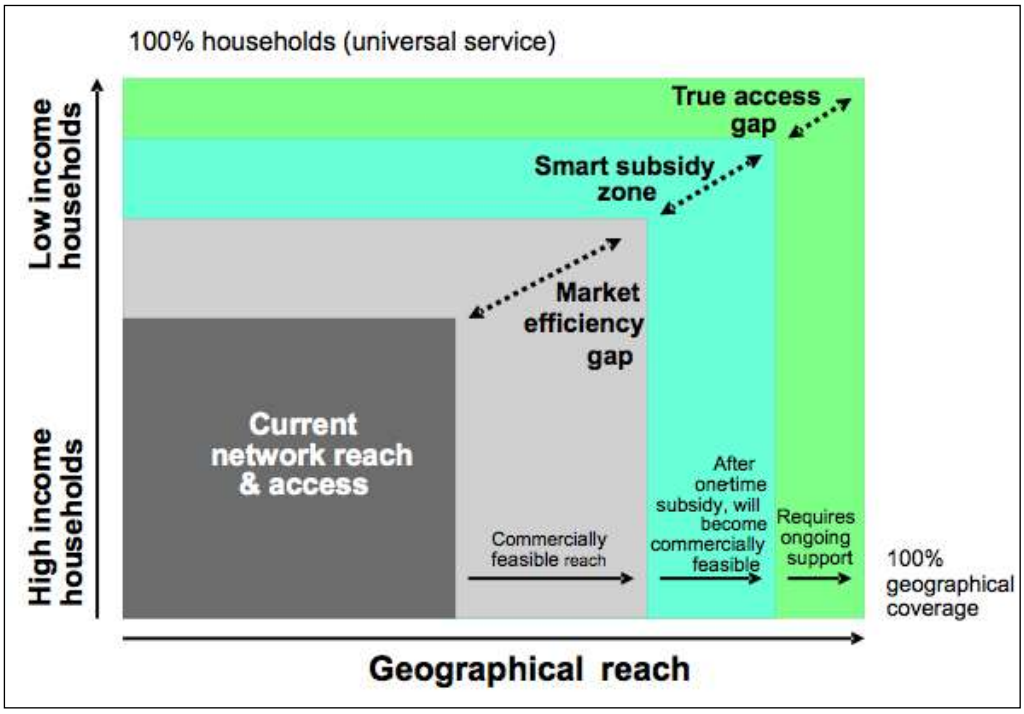
Mongolia and Botswana) or isolation (e.g., many islands in the Pacific region) or extreme poverty, which make UAS more challenging. In other countries, the market might be able to achieve UAS, but the timeframe in which this could be obtained, might be considered too long. In some places, the latter could apply to broadband development.

- Monitoring UAS and updating it. Constant change in technology, services, and pervasiveness of various ICT services, makes it necessary that the status of UAS should be monitored and policies continue to be updated and developed. Also, there are countries where the market can achieve UAS, but there is a need for public oversight to confirm that it has been achieved, to improve regulation, and to continually review the concept of what is considered UAS.

### 6.3.3. Access Gaps and Required Intervention

Three separate zones exist within the known access gap, namely the market efficiency gap, the smart subsidy zone and the true access gap, as illustrated in Figure 6.2. Each zone requires a distinct set of policies and strategies, which together yield an integrated universal access and service (UAS) program.

***Figure 6.2 Universal Service: Distinctions Within the Access Gap***




Source: Intelecon, 2009.

There are also two dimensions to the challenge of achieving UAS: these are poverty and high-cost areas. Poverty exists in both urban and rural areas, but the cost of addressing both poverty and high-cost areas together, as exists in many rural settings, is much higher. Providing access to the urban poor is well within the reach of the market.

*The market efficiency gap* is the gap between the service reach, which can be achieved in a fully liberalized and efficient market, and what is actually achieved by markets under existing conditions. This gap can be bridged through private service provision so long as the regulator and policymakers provide enabling regulation, ensure a level playing field among all market participants, and create a positive fiscal, business and investment climate. This allows operators and service providers to serve a much broader area and close the market efficiency gap. This frontier can be reached within the context of telecommunications sector reform and does not

require subsidies. Many countries are now doing well in bridging this gap through effective competitive service provision. The only issues to be addressed relate to how far the market can actually reach commercially, and how best to implement and sequence more pro-market conditions to reach the limits of the market.

*The smart subsidy zone* refers to rural or high cost areas, and low-income population groups that won't be reached by the market alone, even if it is an efficient market, or at least not for a long time to come. Targeted financial intervention beyond normal regulatory measures and incentives is required to provide services to these population groups and areas. A smart subsidy is the term used to describe a one-time subsidy that is designed to be results-oriented, does not distort the market, and encourages cost minimization and growth of the market. It helps to kick start a project or service, with the ultimate objective of the program becoming commercially viable, whereas without the subsidy investors might otherwise have been reluctant to invest. Investors' reluctance could be due to perceived risk or general lack of capital for the kind of service opportunities that are considered by government to be essential for socio-economic development. The important element of the smart subsidy zone is that the one-time subsidy to private sector providers will make the project commercially viable on an ongoing basis by filling the financial gap. This increases the operator's rate of return and reduces their risk. No further subsidies are needed if the service targets are realistic, and have a medium-term commercial viability in view. Targeted interventions are usually implemented using a Universal Access and Service Fund (UASF). The extent of the smart subsidy zone is sometimes hard to predict and can be a moving target, as it is not uncommon that operators exceed expectations.

*The true access gap* comprises areas or communications targets that are beyond commercial viability, even in instances where initial smart subsidies are given. Commercial sector operators or service providers serving these areas or population groups would need ongoing financial support, possibly in the form of operating subsidies (or end-user subsidies in the case of universal service). It is a political decision if and to what extent to subsidize ongoing service provision to areas and population groups that are beyond the limits of the smart subsidy zone and whether or not to use UASFs to finance such operations. However, even the true access gap can sometimes be bridged with innovative commercially related approaches. In some cases, true access gap areas can be combined with more profitable areas without need for ongoing subsidy. Also, in most countries, the true access gap may apply only to a small percentage of the total population.

In cases where the market is in fact achieving most UAS objectives, a degree of public oversight remains important. It can make progress more visible, highlight any deficiencies and provide a safety net for people with challenges, or places not otherwise served. Constant change in technology, services, and pervasiveness of various ICT services makes it necessary that the status of UAS should be monitored and policies continue to be updated and developed.

In all cases, it is important to work with the market as it develops. This involves, for example:

- Consulting industry and the wider public on the details of UAS policy and its implementation, and taking views expressed into account, especially those that rest on practical experience;
- Ensuring that all market participants have the opportunity to contribute to UAS goals, and receive appropriate recognition when they do so;
- Reviewing policies and practices regularly to keep pace with market and technological developments; and
- Wherever practicable, incorporating competitive mechanisms into the distribution of subsidies for UAS projects.

### 6.3.4. Scope

The services to be included in the scope of universal access and service (UAS) will change as technology and society change. Because of this, in 2002, the European Union (EU) built into the EU Universal Service Directive, a requirement that the scope of universal service (US) obligations be reviewed every three years. To be included in the scope of a UAS policy, a service has to satisfy two tests:

- In the light of social, economic and technological developments, has the ability to use the service become essential for social inclusion; and
- Are normal commercial forces unable to make the service available for all to use?

The EU reviewed the scope in 2006, specifically whether mobile telephony and broadband Internet were to be added. However, neither mobile telephony nor broadband Internet was added for the following reasons:

- Mobile telephony passed the first requirement – ability to use a mobile phone is now seen as essential for social inclusion in Europe – however, normal commercial forces had led to widespread availability and use of mobile phones, so the balance of opinion was that there was no need for regulatory intervention to achieve universal mobile service;
- Broadband Internet, on the other hand, failed the first test – well under half of European households subscribed to broadband Internet and so was not seen as essential for social inclusion. Therefore, the second test was not applied.

While advertised broadband speeds are high, the European Commission found that actual download speeds in 2004/05 were between 144 and 512 Kbps in rural areas and 1 Mbps in urban areas.

A second periodic review was carried out in 2008 which reaffirmed that, in the case of mobile telephony, overall the market provides access. However, in the case of broadband it was now thought that it was unlikely that the market would provide access within a reasonable period of time to the most isolated regions of the EU. The review noted that more and more social and economic transactions were taking place online with broadband Internet access becoming widely available. Finally, it noted that broadband was proving more and more of a necessity for accessing a whole range of services and therefore its impact on competitiveness and economic growth was gradually turning this infrastructure into an essential commodity. There was therefore an argument for strengthening EU and national strategies to provide access. Nevertheless, the review stopped short of recommending extending the coverage of US to include broadband.

Nevertheless, the EU has a clear policy goal of e-inclusion and broadband development, and is active in promoting and expanding broadband take-up and in providing access to above minimum download speed broadband also in rural areas for quality of life, social inclusion and economic-strategic reasons (see Box 6.1). The European Commission believes all Europeans need broadband access and its Digital Agenda underlines the importance of broadband deployment to promote social inclusion and competitiveness throughout the EU.

***Box 6.1 Finland defines "Universal Service" to Include 1 Mbit Internet Connection***

In October 2009, Finland was the first country to declare broadband Internet access a legal right –the definition of "universal service" was expanded to include access to a 1 Mbit Internet connection. As of July 1, 2010, universal service providers must be able to provide every permanent residence and business office with access to a reasonably priced and high-quality Internet connection with a download rate of at least 1 Mbps.

The decree allows for some variation in download speeds to accommodate services provided on mobile networks. The average download speed must be at least 75 percent of the required rate of 1 Mbps over a 24 hour period. In a four hour period, the average speed must be at least 59 percent of the required 1 Mbps download speed.

According to Laura Vilkkonen, the legislative counselor for the Ministry of Transport and Communications, the one-megabit mandate is only an intermediary step. By 2015, the goal is to have speeds that are 100 times faster (100 Mbps) for all in Finland. Vilkonen said, ""We think [broadband Internet access] is something you cannot live without in modern society. Like banking services or water or electricity, you need Internet connection." Vilkonen also commented that the decree is aimed at expanding and improving Internet access to rural areas since geographic challenges have limited access.

Source: Ministry of Transport and Communications (Finland).

For developing countries, modified forms of this general test regarding which services to include into the UAS scope might be employed. The main driver for UAS may be economic before social factors come to the fore, so policy makers in developing countries could ask the following questions:

- In light of economic, social, and technological developments, has the ability to use the service become essential for uniform countrywide economic development or social inclusion; and
- Are normal commercial forces unable to make the service available for all to use, within a timescale consistent with the contribution of the service that will meet the Millennium Development Goals?

## 6.4. Types of Universal Service Regimes

### 6.4.1. Traditional Approaches to Universal Service

Traditionally, before market opening, the incumbent operator, often government owned, had the obligations to provide universal service (USO). In a liberalizing market, imposing USOs on the incumbent operator alone is contrary to the objective of creating a level-playing field. However, shortly after market opening, developed countries often introduced administrative, non-competitive procedures for designating a company to fulfill a USO. These procedures are used where there is only one candidate capable of fulfilling the USO because new entrants are still far from national service provision. Typically, only an incumbent was considered capable as it often was already providing near-total fixed-line coverage.

Recognizing this likelihood, the EU requires USO designation procedures to be "efficient, objective, transparent and non-discriminatory…" but not necessarily competitive. Where an open tender is not used, the EU prefers the designation to be:

- Open, in the sense that both the specification of the obligation to be fulfilled and the proposal of the designated provider are publicly available;
- Subject to public consultation;
- Broken down into components (geographic or functional), so that more than one company can be designated; and
- Of moderate duration.

Some EU countries have opted to make the significant market power (SMP) operator in the retail access market the universal service (US) provider.

If a single operator bears the burden of USO in a liberalized market, the question arises of what compensation the operator receives for providing USO. In these circumstances, administrative procedures for allocating universal funding have been developed. Administrative procedures exist, for example, in the United States, Canada, Australia, and France. All procedures for administrative payment of compensation to operators are based on calculations of the costs that the company incurs in fulfilling USOs. Usually, these are net avoidable costs. "Net" means that the benefits that the company receives from fulfilling the obligation are subtracted from the costs. Benefits are, for example, revenues directly attributed to USO customers, inbound calls to USO customers, and intangible or intrinsic benefits such as ubiquitous presence, brand enhancement and corporate reputation. "Avoidable" means that costs will only be taken into account if they would not be incurred without the obligation.

Calculating relevant costs and benefits for USO funding purposes is a major undertaking. Cost calculations in telecommunications are never clear-cut, and include elements of judgment and attributions that are to some extent arbitrary and estimated. Because large inter-industry transfers may be involved, it is important to make these calculations as accurate as possible. The choice of the costing methodology to be used is important and ultimately must be practical and acceptable to all parties.

The countries mentioned in this section have elaborate cost models for USO costing, and they require specialized expertise to run them. These models also rely on the industry to provide well-founded data input. In turn, these data often require highly developed accounting systems that the companies would not put in place for purely commercial reasons. The difficulty of estimating costs acceptably is one reason why few regulators in Europe have implemented administrative funding of USO even though the Universal Service Directive allows them to do so if they judge that the cost has become an unfair burden on the designated provider. Similarly, Australia carried out a review in 2004 that led to a decision to base future US funding on estimates rather than on detailed modeling.

Some regulators have estimated that the intangible benefits of USO provision (such as brand recognition, positive publicity and marketing) are great enough to outweigh the tangible net costs. Typically, USO providers are incumbents with high market shares of the fixed line market (often well above 80 per cent). Since contributions to shared US funding are proportional to market share, the additional financial support that the US provider would receive is likely a small proportion of the calculated net loss. This may well be less than the overhead cost of running a shared fund, leaving aside the cost of calculating the amount of compensation that is due.

Recently, where mobile operators have secured a much larger share of the total market and reached

almost total ubiquity, the question of US is now subject to redefinition. Internet and broadband development also requires the redefinition of US and how to achieve it, probably requiring a competitive allocation. For this and other reasons, the old method of estimating the cost and allocating responsibility for USOs to operators remains an uninteresting proposition in most European countries and other advanced nations.

Consequently, with more mature liberalized markets, the EU is moving toward more competitive designation procedures led by new member states. For example, Estonia broke new ground in 2006 by being the first member state to designate through an open tender procedure an alternative operator as its US provider – the Finnish company Elisa, rather than the incumbent.

### 6.4.2. Competing for Subsidies and Funds

The first generation of emerging market Universal Access and Service Funds (UASFs) to distribute subsidies, based on the principle of competitive tendering, were established in Latin America in the 1990s. Competitive tenders are also called reverse auction or minimum-subsidy auction because the qualified bidder with the lowest request for a subsidy wins the tender. The first such competitions were held in 1995, soon after the establishment (in 1994) of Chile's Fondo de Desarrollo de las Telecomunicaciones.

The Chilean case, and ones that followed soon afterwards, were unique in the sense that they were also used as a one-stop mechanism to enable potential new entrants to compete with the incumbent operator for universal access (UA) licenses in areas that were poorly serviced but for which a subsidy was offered. The services provided were primarily fixed network payphones, using wireless access or satellite (VSAT) technologies, and were located in places that were at the time, far from areas expected to be serviced by mobile operators.

Following the Latin American experience, a second wave of UASFs occurred in Asia and Africa. Nepal (1998) and Uganda (2000) pioneered the concept in their region, and several others, including Mongolia, Pakistan, Botswana, Burkina Faso, Malawi, Nigeria and Mozambique, are following in their footsteps. This is often with technical assistance from the World Bank or other international donors. The UASF concept had spread to about 50 countries by end of 2009.

Many UASF initiatives are following Uganda's lead by holding technology neutral competitions that are increasingly being won by mobile operators with existing licenses. These UASFs, as well as the early Latin American funds, are also applying their resources to the financing of Internet Points of Presence (POPs) in rural districts, telecenters and cyber cafés, school connectivity, and other ICT initiatives.

Almost all such funds have been created in emerging markets and developing countries in the context of liberalized markets to provide financial assistance for the following:

- Meeting regional and rural service targets for telephony and Internet services;
- Supporting key users, such as rural schools and health clinics, to access the Internet;
- Supporting ICT projects by commercial and development organizations that provide national and local content, services and applications that stimulate Internet take-up and usage; and
- Supporting various activities related to regionally balanced network and service development, such as the creation of Internet Exchange Points (IXPs) and regional Internet points of presence (POPs).

UASFs are primarily:

- A means of financing – in the majority of cases financing comes from a percentage levy of operators revenue;
- An administrative, planning and management entity for UAS programs – UASFs and their programs are often managed by a specially created UASF unit within the regulator or even a separate entity outside of the regulator – this often includes certain management principles such as accountability, transparency and efficiency; and

A competitive mechanism to award a service contract to the commercial sector to provide UAS services in exchange for subsidies from the UASFs.

#### *Sources of Financing*

Most UASFs are financed mainly through annual operator levies although there are other sources, as follows:

1. Government general budget (in a small minority of cases, including one of the first funds, Chile's Fondo de Desarrollo de las Telecomunicaciones);
2. Industry levy, as a percentage of annual revenue, on certain classes of licensed operators;
3. Various other regulatory sources such as the proceeds of license competitions, frequency spectrum auctions and fees; and
4. Once-only contributions financed by loans or grants from international donors such as the World Bank that contribute seed finance to assist UASF start-up in the early years.

UASFs financed mainly by operator levies are independent of available government funding and are particularly attractive for low-income countries with limited resources and more pressing government budget priorities. However, countries with more resources could consider contributing some amount from the government budget to the UASF. After all, the UASF implements government policy. It is important though that the UASF remains independent from day to day politics to fulfill its long-term UAS objectives, and that it continues to focus on sustainable solutions with effective and cost-efficient private sector participation.

A strong argument can also be made that at least part of the proceeds of radio frequency auctions and license competitions should be used to source a UASF. Guatemala's FONDETEL used this financing approach. Auction proceeds are paid by various industry players for a national resource, the proceeds are often simply transferred to the government budget, but instead it might be more appropriate to use this money particularly for ICT development, such as to fund UAS or special measures for broadband development (e.g., increasing PC ownership or equipping schools with computer labs and broadband access).

A stronger case could be made that the funding should, if possible, be more balanced between the first three financing sources. Important though in all cases is the predictability, timing and the frequency of the funding to allow proper planning and constancy for the UAS implementation.

### *Planning and Management Entity for UAS Programs*

Regardless of the financing sources, an instrument like the UASF is also an institutional vehicle to plan, administer, manage and implement UAS programs. Often the national regulatory authority has a specific department that manages the UASF on a day-to-day basis. The two main reasons for this are as follows:

1. The regulator will have a degree of independence from government and industry; and,
2. The regulator will have technical and regulatory expertise.

A UASF program will have a greater chance of success if the regulator has a strong reputation for independence and industry trust. This is even more important if the government still has an ownership stake in any of the operators.

Regardless of which entity is chosen as the UAS unit, key management principles that are required to ensure success and the financial integrity of UASFs include:

- Accountability;
- Transparency;
- Independent auditing, publication and annual reporting;
- Keeping administrative costs to a minimum; and,
- Efficient use of funds.

Another important element of UASF is effective oversight. It is best practice that the regulator provides the Secretariat expertise and everyday management under a special Management or Advisory Board which provides high-level strategic direction, approves major projects and fund disbursements, and monitors proper execution and financial integrity. Most UASFs have a Board functioning above the level of the senior executive. However the Board's role differs from country to country, depending on specific local factors. Options for UASF Boards are as follows:

- Direction or management – making executive decisions on a wide range of issues from hiring of senior managers to budgetary approval, approval of UAS program and projects, and the final award of subsidy contracts;

- Monitoring and oversight – ensuring that the decisions of the executive (whether named director, manager or administrator) and his/her management team are scrutinized on behalf of stakeholder interests; or,
- Consultative or advisory – requested to review proposed UAS programs and projects, executive decisions, provide expertise and advice which is published and requires a formal response by the UASF management unit.

### *Competitive Subsidy Allocation Mechanism and Smart Subsidy*

A smart subsidy is a one-time and partial subsidy that can leverage additional commercial investment, and is minimized though a competitive procedure. The objective is to enable operators to bring a potentially loss-making or marginal project into a normal commercial rate of return. The mechanism of a smart subsidy competition is geared to the achievement of realistic universal access and service (UAS) objectives. UAS targets are realistic and feasible for the market if commercial operators, with some smart subsidy support, will be able to and will want to achieve them. The subsidy thus represents an amount that bridges the operator's financing gap. It could be viewed as support to offset capital investments, capitalized operating losses for the first few years, or a combination of both. The important concept here is that the subsidy is a once-only allocation which may be disbursed in tranches over a stipulated period of time (e.g., one to three years) corresponding to various output milestones, but is not open for renegotiation or longer term continuation.

Key advantages of UASFs include:

*Transparency and Fairness*

A UASF that adheres to best practice provides a transparent means of allocating subsidies for the achievement of service targets in commercially unviable areas. All operators and service providers pay into the fund in equal proportion to their revenues, making the cost of UAS shared equitably among operators. Technology neutral competitions allow all operators and service providers a fair chance to win a UAS subsidy competition. The alternative of mandating targets runs the risk that it would be difficult to allocate fair targets for different operators in a competitive market. It would require that the costs of the targets are established and then distributed proportionally among the industry.

The valuation of the contribution of each operator towards UAS would require the regulator to seek confidential financial information (revenue, capital and operating expenditure) from each operator. This would be akin to the administratively heavy approach taken in traditional price regulation.

*Emphasis on innovation and least-cost solution*

One of the key challenges is to properly establish the cost of UAS provision. This requires complicated cost models, well-developed internal accounting systems within operators, and may result in disputes. Another challenge is to use a system that encourages cost-minimization and innovation. UASFs using competitive subsidy bidding mechanism avoid detailed cost modeling but instead use simple cost models that help establish a maximum subsidy ceiling. By using a competitive process, there is an inbuilt incentive for least cost innovative solutions, as the bidder requiring the least amount of subsidy wins. However, it is important to note that the bidding process is not geared towards the cheapest solution but rather, as a first step, a bidder has to comply with specific corporate, financial and operational experience requirements and demonstrate that it can meet the service and quality specifications for the UAS provision.

*UASFs Provide "Pay or Play" in Practice*

With a UASF least subsidy tender, no operator is forced to participate in the competition. Thus operators who are not interested in serving rural areas or providing public access are free to opt out, though they do have to contribute to the fund. The UASF can be a way of requiring that the industry at large contributes to financing the achievement of UAS, while only operators interested in expanding to rural areas will tender for the subsidies. The successful operators will, in fact, have a portion of the funds they contributed and maybe more, returned to them.

*UASFs Can Bring Finance into the Sector*

UASFs present a mechanism for government, or donors such as the World Bank, to contribute financially to 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.

*The Public Interest is Explicitly Served*

The process of good governance typically requires an explicit determination of objectives and targets, a process of consultation, buy-in by all stakeholders, and satisfaction by consumer representatives that various interests are balanced for the public good. This has been achieved reasonably well in the case of the best-practice UASFs currently in operation that held public tenders. It would be difficult to achieve the same level of confidence through a trade-off negotiation with operators, unless the UASF administration could clearly demonstrate the basis of the balance of interests and fairness achieved, with a high degree of transparency.

### *Challenges and Alternatives to UASFs*

The increased use of UASFs and their experiences has also brought to the forefront some challenges of the UASF approach which can be summarized as follows:

- Some UASF funds have not been allocated in a technology neutral manner;
- Some UASFs are not managed in a transparent manner;
- The levies collected by some UASFs are directly fed into government budgets instead of being dedicated to projects in the ICT sector;
- Some UASFs have accumulated too much money and allocated too little; and,
- UAS program planning and implementation has sometimes been overtaken by market developments.

Some funds established before the mobile service explosion limited fund distribution to fixed-line operators while asking mobile and wireless operators to also contribute to the fund, which primarily benefited the government-owned incumbent operator. This was against the principle of technology neutrality, equity between contributors and eligible recipients of funds, and did not encourage cost minimization. Experiences highlight the importance of adhering to those key principles when operating a UASF program.

Also, some UASFs had only allocated a small portion of the funds for the implementation of UAS provision from what they had collected. Underneath this lie two problems:

- The percentage levy to be collected from operators was set too high, collecting more funds from the sector than the UASF was able to use and allocate, thus depriving the sector of important funds for commercial investments and expansion. This was sometimes caused by an under-estimation of market growth; and,
- The pace at which UAS programs were planned, projects designed and bidding processes implemented was sometimes too slow.

The latter point also relates to the fact that UAS program planning has in some instances been overtaken by market developments, especially the rapid spread of mobile coverage in many developing countries. Consequently, global experience with extending access and UAS policies is evolving and in recent years the following approaches have been implemented, either separately or in combination:

- Market based reforms
- Mandatory service obligations
- Leveraging new technologies, e.g., mobile services
- Leveraging new business practices, e.g., pre-paid cards
- Cross subsidies
- Access deficit charges
- Universal Funds
- Public-private partnerships

Of these, the most successful have been the market-based reforms associated with the liberalization of the mobile sector, supported by a stable regulatory environment and the subsequent exponential growth in customers in developing countries. These initiatives have allowed market forces to contribute fully and thereby close the "market gap". Regulators have used a variety of methods to achieve UAS through market forces, including regulatory reforms that create incentives for the private sector to extend universal access, establishing interconnection frameworks, flexible spectrum rules and other technology-neutral policies to encourage the entry and use of new and innovative technologies and provide a wider range of participants to achieve UAS goals. The remaining "access gap" can be categorized as:

- Communities that only require a targeted capital injection where future revenues will support

operational expenditure, often referred to as the "sustainability frontier" and

- Communities that require ongoing support for both capital and recurring expenditures.

The practice of ensuring universality by using cross subsidies between the different services of an operator (from international to local and/or access) to ensure affordability has been severely strained by the introduction of competition. Access deficit charges have also been found to be sub-optimal in competitive environments. In many jurisdictions, Universal Service Obligations (USO) are in place. The informational demands on regulators are considerable where a designated operator (frequently the incumbent) is reimbursed for the losses incurred or reported in the provision of UAS.

While UASFs are an important tool, they should not be solely relied on to achieve universality. Other mechanisms to be considered and adopted include direct state aid and public financing such as loan guarantees and public-private partnerships, as well as liberalizing the licensing and spectrum frameworks.

Where UASFs are used, they have proved effective when disbursement is coupled with competitive bidding or auctions for these financial incentives, requiring operators to compete for the minimum subsidies needed to fulfill the UAS target. Since subsidizing ICT projects carries certain risks such as market distortion, dependence on funding, fraud and abuse, favoritism and wasted resources, regulators have introduced "smart subsidies". Smart subsidies provide a one-time award geared towards obtaining results in areas where investors have been reluctant to invest, but will ultimately become commercially viable. Thus, the subsidy acts as more of a kick start to investment rather than as a crutch. The Dominican Republic provides an example of where a smart subsidy, known as an output-based aid (OBA) subsidy, has been used. The regulator conducted transparent, minimum subsidy auctions in which the winners receive the subsidies in phases over the course of the project rather than all at once. Thus, winners receive 20 percent upon signing the contract, 40 percent upon completion of the required installations and the remaining 40 percent in six month installments over a five-year period.

In some instances, subsidies have been provided directly to customers or to particular institutions, such as libraries, schools, and public tele-centers. Early, large-scale UAS projects were frequently undertaken on a top-down, supply-driven approach where a single provider, often the incumbent, was selected to provide a standard set of services, using a narrow set of technologies over a wide geographical area. The introduction of NGN-related technologies, such as Broadband Wireless Access (BWA) and Wi-Fi, has substantially reduced economies of scale in both the infrastructure and service segments. This has opened up the field to a wider range of small or local providers to expand universal access from a bottom-up, demand-driven approach.

The phenomenal spread of the Internet has had an impact on notions of universal service. In the 2002 Universal Service Directive, the EU included the concept of "Functional Internet Access" in the definition of universal service and is currently constructing a "future proof" regulatory environment. For example, in September 2009, the EU announced that it will inject EUR 1.02 billion into the European Agricultural Fund for Rural Development (EAFRD), part of which will be used to support investment in high-speed broadband to help ensure 100 percent coverage to EU citizens by 2010. As part of the EU's stimulus plan to secure investments in broadband deployment, Member States must ensure that provision of state aid is 1) granted out of state resources; 2) confers an economic advantage to businesses; 3) selectively targeting recipients and is not distorting or threatening to distort competition; and 4) affects intra-Community trade.

In a converged economic space of electronic communications, new forces have been set in motion. VoIP business models are leading to the erosion of revenues from voice services for operators, while the intensification of competition is hastening the transition to NGNs. While NGNs provide the opportunity for a much wider range of revenue-generating services, the platforms will be deployed on a commercial basis. It is quite possible that this deployment will follow the geographic and income-related distribution of computers in businesses and households. This implies that those locations currently underserved or benefiting from a UASF will not be among the first to be connected. Furthermore, given the shift in cost towards the user, when the cost of a computer is included, the concept of "affordability" must be re-examined. Clearly there will be an enhanced role for shared access and community-based initiatives.

There is growing interest in and experience of community-based projects to provide Internet services based on the "municipal open access model." A study by infoDev in 2006 found numerous examples of community-based projects, including the Myagdi, Kaski, and Parbat districts in north-west Nepal; the municipality of Pirai in the Rio de Janeiro state of Brazil; and the city governments of Philadelphia (U.S.) and Knysna (South Africa).

The debate over the role of broadband in universal service is underway around the world, such as Chile and India. In 2006, India was one of the first countries to include broadband in the UASF, which allows the fund to support broadband connectivity and mobile services in rural and remote areas. Convergence, facilitated by NGNs, raises the potential externalities by increasing the potential benefits to households of services if they had access to them. Convergence may possibly increase the sector base on which levies can be made for a UAS Fund while also raising specific regulatory issues related to universal service regarding voice quality, emergency services, and services for the disabled. Overall, policy makers should keep in mind that UAS requirements have expanded to include broadband due to the rise of NGNs and convergence. While market forces are dynamic, UAS policies should build on competition to encourage deployment to all.

#### *Rural Broadband Development*

Looking at the three components of UASFs – means of finance, institutional entity to plan and implement UAS programs, and the competitive smart subsidy mechanism – and taking into consideration the negative and positive experience of funds, for one of the main tasks ahead for UAS, rural broadband development, the following seems clear:

- It is necessary to limit the amount levied directly on operators as a percentage of revenues and at the same time to widen the pool of other financing sources. International experience indicates that no developing countries appear to have been able to disburse more than a maximum of 2 per cent of sector revenues in their UASF program. International experience also indicates that this figure should not be static but should be slightly flexible to reduce contributions over time as the market grows and UAS targets are progressively achieved. At the same time, considering the potential finance required for rural broadband development, it seems also crucial to widen the sources for financing the UASFs and include licensing and frequency auction proceeds (e.g., a certain percentage of the proceeds) and government sources to the pool for the UASF.
- Delays in allocating funds as well as delays in implementing programs both point to the requirement to increase capacity and efficiency of the organizations or departments charged with planning and implementing UAS programs.
- The competitive smart subsidy mechanism and co-operation with industry has proven very successful and should be maintained and could be incorporated into other approaches as well, such as selecting a private partner for public-private partnerships.

### 6.4.3. Non-government and Community Initiatives

Non-government organizations and local communities can play an important developmental role in universal access and service (UAS). They represent bottom-up rather than top-down policy driven initiatives and in many cases they have become significant contributors to the objective of reaching underserved populations and of bringing communications and improved livelihoods to the poorer segments of society. The focus on community involvement is typically more prominent with ICT and broadband initiatives.

Of particular note are the following models and experiences:

- Public private Partnerships (PPPs): The provision of UASF funding support on infrastructure projects is, arguably, a form of PPP. Even though the funding is levied from the industry, it can be seen as a specific-purpose tax and as such becomes state property. The government, through the UASF, allocates it to sector players, which sign special contracts with detailed obligations that they would not otherwise have. The retention of even partial ownership by the government is less important than its ability to play a role in directing the behavior of the operator. In the case of most UASF programs, the primary role for the host government (and/or regulator) is the analysis

and setting of direction as to which targets for infrastructure development shall constitute the minimum acceptable level of coverage in telephony and ICT access and service provision, and which areas will need financial assistance to meet targets. Other examples include developments where the government, through loans or grants from the World Bank, has provided seed finance for piloting (e.g., Mongolia and Mozambique), or to support the first round of universal access (UA) project tenders (e.g., Uganda and Mongolia).

- Micro-finance and entrepreneurial village phone initiatives – these are now well-known, not least because of the high profile Grameen Village Phone initiative in Bangladesh launched in 1997. The Grameen Bank provides impoverished village women with financial support to develop sustainable income generating activities. Female clients of the Grameen Bank who show the initiative to become local Village Phone Operators (VPOs), receive training and are loaned funds to purchase a mobile phone set-up (phone with special in-built pricing software) suitable for rural areas, as well as airtime credits. Through the network of VPOs, vending affordable airtime denominations and facilitating individual calls, residents have access to communications. In 2006, Muhammad Yunus, the founder of the bank, and the Grameen Bank itself, were jointly awarded the Nobel Peace Prize "for their efforts to create economic and social development from below". Similar initiatives have been replicated in many other countries. However, in Bangladesh itself, the increased mobile penetration and the large number of village phones itself is eroding the profitability of the model. It is likely that value-added services need to be added to the village phone concept to remain relevant and sustainable.
- Community networks are a recent trend, however there are a few established examples which demonstrate some success factors. Often, these examples are small-scale initiatives. Pre-conditions for success include the following:
  - A minimum critical size – for example, a typical community network based on WiFi technology requires a population of around 15,000 with annual income per person of US$500 to support itself. As technology costs reduce further, the size of population critical for success will also shrink. Still, many communities will be too small to support successful community networks;
  - Communal consciousness or some level of organization enabling the population to function as a community, express its shared needs, and act in its own interests is necessary for community networks to succeed;
  - Local leadership and, preferably, a core of committed people with a certain level of education and technical skills;
  - Access to external technical and managerial support, especially if these skills are lacking locally; and,
  - A supportive political and regulatory environment that promotes community networks.
- Internet public access, telecenters, and cyber cafés – there is a very wide range of sponsors of telecenters, of funding sources and organizational and management models; also, many telecenters have been established through UASF competitive tenders. It appears the models are more successful:
  - If there is a network of telecenters which works together;
  - If there is a financing model in place that secures ongoing sustainability (often the cost of maintaining, upgrading and replacing equipment is underestimated, while service revenues are over-estimated);
  - If services are tailored to local demand; and
  - If telecenters are operated either commercially by local entrepreneurs or at least adhere to a certain degree to commercial management practices.

  Gaining sufficient broadband quality is crucial so that Internet users have an Internet experience that is relevant, worthwhile and which will engender ongoing interest in ICT. This challenge led the planners of Uganda's rural communications development program to focus on providing broadband Internet Points of Presence in district centers, where demand is most likely to exist and key users might emerge, ahead of focusing on telecenters. In several

places, commercial cyber cafés emerged once broadband Internet access was made available. These businesses could provide the experience as well as technical resources to support community initiatives or assist vanguard institutions such as schools, hospitals, community broadcasters and government offices. The practice of focusing first on Internet POPs has now become standard practice in many of the new generation of Universal Access and Service Funds (UASF);

- Community radio or local radio - While there are no fixed definitions of what UAS means in the broadcasting field, there is a certain consensus on what its key dimensions are. These include local media, plurality and diversity. It is essential to ensure that all citizens have access to a local radio station as a forum for local debates, relevant information, and cultural expression. It is important that local media provide a diversity of content and plurality of information and opinions. Further, radio is a mass medium that promotes community interaction and social communication processes. Rural radio is not only important for UAS to broadcasting services, but it can also play an important role in spreading the benefits of Internet access. In many cases, successful use of the Internet for development requires community intermediaries that can overcome issues of pre-literacy, lack of ICT training and language barriers of the Internet. Local rural radio, which has Internet access, is emerging as one such successful intermediary because it is accessible, affordable and cheap to produce.
- Co-operatives - While only existing in a handful of countries, co-operatives are providing communications services in some rural and remote areas. Analyses of experiences to date show that co-operatives only thrive when certain conditions are in place and that the model is not applicable to every country or situation. However, there are considerations in the development community, whether co-operatives might be the model to deliver broadband to rural and poor areas. More piloting and experience with this approach needs to be gained to see if that is the case.
- Regional or rural operators - Reviewing the limited experience with regional or rural operators as a tool for UAS provision, also in light of possibly adopting a rural or regional licensing strategy for broadband development, the key findings are:
  - There is an inherent market tendency for rural or regional operators to become national operators, either by being bought by a national operator, or through their own drive to grow and become a national operator. It is possible that regional or rural operators might be a temporary phenomenon; and,
  - Introducing regional operators can be an effective tool for introducing new entrants and more competition. If a regional license is focused on areas that are less well served and coupled with the incentive of being converted into a national license within a reasonable time, it can have the triple results of: a) Increased service in previously un-served areas; b) Increased competition; and c) A period of time to prepare and adapt to increased competition for existing player(s).

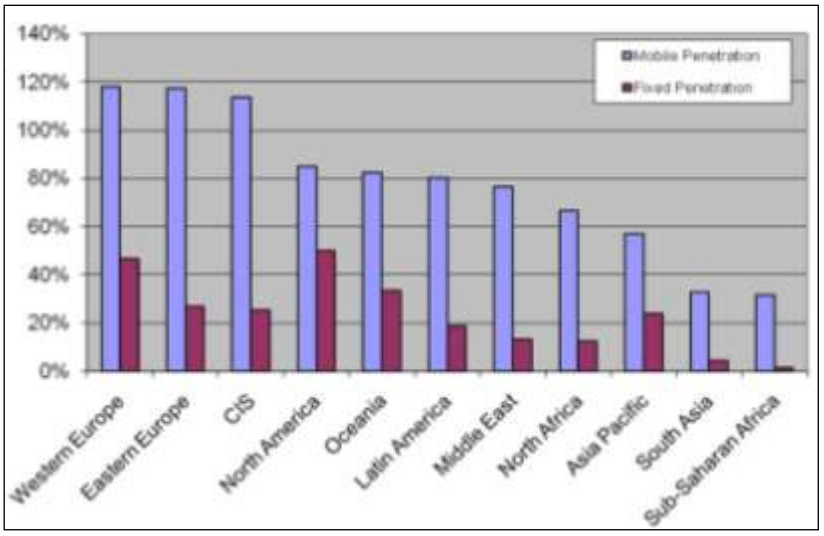
### *Community Involvement in UAS Projects*

Communities have a role to play in UAS for the following reasons:

- Some available low-cost communications technologies can work on a neighborhood scale and are not too technically demanding, e.g., WiFi and VoIP, with free and open source software (FOSS);
- There is a recognition of the critical role local leaders have in tailoring ICT facilities and services to local needs as well as the importance of community ownership of ICT programs, which is vital in working towards sustainability;
- Communities have a growing awareness that poverty is a complex phenomenon, stemming from a lack of political power as much as from a lack of money, and that grass-roots initiatives, which build local competence and confidence, contribute significantly to poverty relief; and

There is a rising popularity of multi-stakeholder partnerships, in which the public sector, the private sector and other interested parties work together, each contributing finance, skills or other resources. For best results, end-user communities should usually be development partners.

***Figure 6.3 Fixed and Mobile Penetration, 2008***




Source: ITU World Telecommunication/ICT Indicators database.

## 6.5. Reforming Universal Access

### 6.5.1. Changing Contexts and Trends

The following are major trends that challenge and shape UAS policy development.

#### *Much More Ambitious Goals*

Technology change and market growth have lowered costs to the level where universal access (UA) to voice services has been achieved or is soon achievable for most developing countries, and a degree of use is affordable for almost all citizens. Many developing countries can now set their sights on universal service (US) goals for telephony, see Figure 6.3 (subscription penetration translates into a higher household penetration). UA for Internet has already been part of many UAS policies, but now the new frontier is setting the goal of achieving access for all to broadband services. Access alone is not sufficient; the capacity and speed is important and will have to be continually improved. Telecommunications markets are dynamic; new technologies are constantly emerging, and new services rapidly become popular and then indispensable. Therefore, universal access and service (UAS) aspirations will continue to rise over time.

#### *A Wider Array of Models and Approaches for UAS*

Since liberalization, many developing countries have introduced UAS policies and programs and there is a wider array of models, experience and best practices to build upon. With the advent of broadband, new ideas and models are emerging and are piloted and implemented to achieve rural broadband access. Existing UAS models need to be reviewed regarding their applicability and, as required, adapted.

Most models recognize the importance of understanding and incorporating market forces into their approaches. Many UAS models are working with the commercial sector and use competitive approaches where appropriate.

#### *Greater Interest in Reaching the Poor by Commercial Companies*

Probably brought on by declining growth opportunities in traditional markets as they mature and saturate, there is a general trend for many operators and service providers to focus their attention also on the still unreached markets. In addition, Corporate Social Responsibility (CSR) programs, base of pyramid marketing and concepts of social investing, contribute to the interest in serving the poor.

#### *Complex Interactions with Other Policies*

ICTs support many applications and services and influence the performance of many other sectors. Consequently UAS policies should ideally be designed in co-ordination with, or at least with consideration of, other government policies, including those for computer applications, health, education, government, and rural livelihoods

(including electricity, infrastructure, etc.). Countries require overarching national ICT policies that address the sectors impacted by ICT and outline ICT development in all sectors of the economy and society. UAS policies are typically a sub-policy to the national ICT policy with the focus on areas and services that cannot be reached by the market alone. However, UAS policies aimed at increasing telecommunications infrastructure and access should not be impeded if other sectors are slower.

### 6.5.2. Technologies for UAS

Developments in technology affect the cost, acceptability and feasibility of services and have a direct impact on universal access and service (UAS). Because technological developments influence regulators' expectations and users' technology preferences, minimum requirements for and expectations of UAS increase over time.

UAS policy needs to be resilient and forward looking as it takes emerging technologies into account, but it should aim to be technologically neutral. Regulators should be informed observers regarding technologies, but they need to allow UAS providers to choose which technologies are cost effective.

As an overall principle, it is important to note that technologies are neither isolated from market, nor solely the determining factor in successful service provision. Country by country, whether a particular technology is an appropriate solution for UAS and rural areas, and for low income people, depends strongly on these market factors:

- Competition (the market position of the providers, their service packages and pricing strategy);
- Demand and affordability;
- Customer density; and
- End user terminal distribution and availability.

Such factors should not be overridden by governmental preferences; technological choice should be left to service providers and the regulator should focus on providing equal opportunity for participants.

These trends create a new ICT network paradigm for the Information Society and imply that there is a need for UAS policy interventions to encourage network and service build-out in directions that are regionally balanced and ubiquitous. However, just as the mobile revolution has driven progress in achieving UAS for telephony, it would be advisable for regulators to give high regard to fundamental market developments taking place in the broadband field also.

In summary, policy makers and regulators need to recognize the following:

- The requirement for UAS has moved from pure telephony to include broadband (thereby allowing access to different types of content and ICT applications);
- The trends in Internet and IP development, NGNs and convergence are giving impetus to the emergence of a "broadband revolution". Commercial and market forces in this development promise to be just as dynamic as those which drove the mobile revolution;
- UAS policy needs to harness the principles of competitive market regulation and technological openness/neutrality to encourage the most economic and sustainable deployment from among the plethora of technologies available for ICT.

## 6.6. Strategies for Developing Economies

### 6.6.1. Developing UAS policy

Developing a universal access and service (UAS) policy begins with these essential questions:

- Who is the lead ministry or entity developing the UAS policy;
- What is the main purpose for developing the UAS policy? (e.g., social harmony/ regional balance; economic growth; global competitiveness; reduction in rural to urban migration; poverty reduction); and
- What are the aspirations of the UAS (e.g., there can be different emphases on telephony, Internet and broadband – depending on UAS goals already achieved).

### *Steps in Developing UAS Policy*

There are several stages and procedural elements involved in developing UAS policy:

1. Sector review – Establishing the current status quo, barriers to growth, potential solutions and UAS strategic options;
2. Policy formulation – Setting specific objectives, time-bound targets and strategies to achieve those goals;
3. Regulatory measures – Their priority over other government interventions and their ability to reduce costs of implementing the UAS policy;
4. Financial analysis – Identifying the required financial resources to implement the policy;
5. Economic appraisal of UAS options - Using strategic socio-economic considerations for policy development, and micro-economic analysis to decide on priorities and sequence within a UAS program; and
6. Consultation – Several stages of consultation with various stakeholder groups to solicit input, feedback and develop broad buy-in.

### *Objectives, Targets and Strategy*

Decisions on the following key questions need to be made after the sector review process has provided a foundation of data, analysis and initial viewpoints from various stakeholders:

- Which services (e.g., telephony, Internet, broadband but also directory assistance and access to emergency numbers) should be included into the universal access and service scope
- Which specific targets for each of the services should be set;
- What main groups should be targeted (e.g., rural population, urban poor, people living in socio-economic depressed areas);
- What other special targets are advisable e.g., schools, libraries, hospitals, etc.);
- What timeframe should be set for certain targets to be achieved and what timeframe will the UAS policy cover;
- What approach should be used and which strategies employed, covering:
  - Estimating cost of achieving set targets and whether public funding (subsidies) is required;
  - Who will provide the funding and how is it collected;
  - Who will deliver the services (e.g., operators and service providers, NGOs, entrepreneurs, etc.); and
  - How will those entities be selected.
- Future proofing: How will the policy be adjusted to reflect market changes over time? Targets need to be feasible, as well as forward-looking and future-proof, so that they remain valid and appropriate during the lifetime of the policy and are not superseded by market developments. Most policies are designed for a five to ten year horizon, while a UAS program sets targets for one to three years. The policy itself should allow for a process of review and update so that it may adjust targets.
- Who is going to take the lead in the implementation (including coordination and monitoring) of the UAS policy?

### *Who Should Develop and Draft UAS Policy?*

Typically, a UAS policy is developed by the ministry responsible for communications (or in countries without a ministry by the entity responsible for communications), often with the regulator's significant input or maybe even with the regulator's drafting of the policy.

Ministries other than the one responsible for telecommunications and ICT (e.g., education, science and technology, economic planning, finance, municipal and local government) are also considered to be stakeholders. For example, one or more might have a seat on the Board of the Universal Access and Service Fund (UASF). However, their involvement in the UAS policy development and drafting is usually one of contribution to a consultation process rather than as an actual sponsor of the policy.

Consultation can be considered a mandatory part of UAS policy development and leads to better results. The telecommunications and ICT industry, as well as non-government organizations (NGOs), should also be part of the UAS consultation process.

### *Who Implements UAS Policy?*

UAS policy may be implemented by: the country's National Regulatory Authority (NRA), the ministry responsible for telecommunications and ICT or an independent agency. Each is considered below.

*Regulator*

Many countries opt to have the independent NRA responsible. This is a sound approach because:

- The regulator typically has the required industry sector expertise, and skilled technical, economic and financial staff;
- The regulator has a degree of independence and is perceived to be one step removed from politics; and
- The regulator has established relationship and credibility with industry, often the main partner in the implementation of UAS policy.

There is a trend towards multi-sector regulation, including broadcasting. Under this scenario, the same reasons apply for it being responsible for UAS implementation.

*Ministry*

In a number of countries, the ministry responsible for communications implements UAS policy (e.g., Colombia, Guatemala, Peru and India where the ministry manages the UASF). This has the apparent advantage that the agency responsible for policy is taking responsibility to carry it out. However, a possible disadvantage is that since the UAS policies sometimes include special financing instruments (e.g., a UASF) for which the main contributors are the industry (either through a levy or use of frequency receipts), government is not perceived as being far enough removed to be an independent administrator of the finances, especially if the government has any ownership interest in the industry.

***Box 6.2 UAS Policy of the Republic of Ghana***

Ghana's UAS policy is defined in the section entitled Universal Access to Communications, under the National Telecommunications Policy 2004.

**Policy Objectives**

The policy seeks to achieve universal access and universal service for telecommunications throughout all regions and communities, and to achieve a universal service penetration of 25 per cent of the total population, and of 10 per cent in rural areas, by the year 2010.

A particular focus is set on improving the access to telecommunications in schools, health facilities, and community centers.

**Policy Targets**

The universal access target for Ghana is to ensure availability, through broad geographic coverage, of community-based broadband services to include voice, data, and Internet services, and to include local content, and community radio and government services. These services and content must be of high quality and available, affordable for all citizens.

The establishment of multi-purpose telecenters or community media centers in underserved locations is a priority, and so the projects that specifically target such needs shall be given a priority (for instance, through the funding mechanism).

The universal service target (to be simultaneously achieved) is to ensure service and content availability to households or individuals as above, except that this may also include traditional telephony services in addition to broadband.

**Approach and Financial Mechanism**

Every licensed or authorized operator in Ghana is required to contribute, on an annual basis, to the Ghana Investment Fund for Telecommunications (GIFTEL). GIFTEL shall facilitate a partial investment funding for eligible projects in under-served areas. Eligibility is largely based on those policy targets set out above, and funding shall be made on a non-discriminatory basis.

GIFTEL funding is allocated on a competitive basis through an open bidding process. Funds will not be allocated to those locations where commercially viable services are available.

Funds allocated through GIFTEL will only be provided based on the successful assessment of a plan's long-term financial sustainability. This assessment shall reflect how inclusive the plan is with regard to local stakeholders, and in particular for those who are at a disadvantage.

Specific obligations may be placed on licensed operators in order to help facilitate the policy objectives; this may include specific interconnection responsibilities.

Source: ICT Regulation Toolkit.

*Independent UAS Agency*

A few countries have opted to establish a separate agency. South Africa, Pakistan, Ghana (see Box 6.2) as well as the United States and Canada have established separate UAS agencies. Peru and Nigeria have independent banks or trusts as the financial managers for a UASF, even though the regulator in Nigeria has the planning and secretariat role while the Peruvian fund is under the Ministry for Transport and Communications.

While a completely separate agency elevates the status of UAS and creates at least the appearance of even greater independence, it may come at a higher cost as well as with increased complexities of co-ordination.

### Policy Documents

A UAS policy should adhere to policy formulation standards, processes and formats. Although these may be unique to each individual country, as a general guide the following elements are usefully addressed in the policy:

- Introduction and background;
- Status of the telecommunications and ICT sector;
- Vision, policy direction and objectives;
- Key challenges and barriers (e.g., regulatory issues);
- Strategic mechanisms for the implementation and funding of UAS;
- Implementation arrangements;
- Principles of operation of the chosen instrument(s), for example:
  - Universal Access and Service Fund (UASF);
  - Mandatory service obligations issued with new licenses;
  - Competing for subsidies;
  - Regional operators;
  - Infrastructure sharing;
- Monitoring, evaluation and review.

### Financial Considerations and Analysis

Policy development should consider the desired outcome and the available financial resources in order to arrive at a feasible strategy. Countries benefit from having realistic objectives and targets that can be financed without strain, and which they have the capacity to manage.

If policy makers set UAS goals and targets that are too ambitious to achieve, e.g., would cost perhaps 5 per cent or more of the sector's annual revenues to subsidize, it might be unrealistic to set these goals. But a program that costs only 1 per cent of the sector's revenues is more realistic, as long as the program administrator (e.g., the UASF) has the necessary management and staff to ably administer the projects.

The three main questions related to finance in UAS policy are:

- What is a financially feasible UAS policy, i.e. what is the limit?
- Where should the financial resources for a UAS program come from; and
- How much finance is required to implement the desired UAS policy and program strategy?

### Finance to Implement UAS Programs

Typically, the amount of finance a UAS program requires is estimated in the context of appropriate operator levies. There are two ways to estimate the appropriate level of UASF contributions:

1. Policy-driven approach – Determine what scale of subsidy program would be required to meet the country's policy objectives and time-bound universal access and service (US) targets. The total cost and subsidy estimates are compared to the total sector revenues. The percentage of total sector gross or net revenues calculated by this method becomes the high level estimate; or
2. Market-driven approach – Determine from a survey or assessment of operator and other stakeholder opinions, as well as from international benchmarks, what operators would accept or could afford as a reasonable contribution. Then develop the UASF program to match this.

The actual amounts required from the industry will vary depending on other existing financing sources available, such as government budget allocations, proceeds from licensing and spectrum auctions and development partners.

### *Economic Appraisal of UAS Options*

Detailed economic analysis is typically undertaken during the development of UAS programs, often to determine project priorities, and is less important at the UAS policy development stage. However, broad economic considerations are important in the policy formulation. Countries develop UAS policies based on the premise that access to basic and advanced telecommunications and ICT services have a wide-ranging socio-economic rationale. This recognizes the importance of telephony and ICTs as enablers of growth and equality in the country, and competitiveness on the world stage. However, some projects may deliver different types and levels of benefit more than others, or deliver the benefit in different parts of the country, all of which are reasons why the selection of UAS programs and projects need to be made carefully and priorities set for available options.

Agencies that implement UAS need to consider and analyze the economic impact and relative value of UAS strategic options, programs or projects, make selections or set priorities in the context of national economic growth, developmental impact (including poverty alleviation), commercial viability, regional balance and related economic concerns. For instance, it may be that a competitive mobile market might be the best way to deliver UAS objectives (see Box 6.3). Key factors to be considered in the implementation stage of UAS policy include:

- The total population reached by each project or potential investment;
- The expected impact and poverty reduction effects, compared to the vision and objectives;
- The regional benefits and equalization in socio-economic terms;
- The commercial viability and sustainability of a program;
- Leveraging of private participation;
- The subsidy cost per beneficiary; and
- The benefit to cost ratio.

### *Legal Modifications and Regulations*

Once a universal access and service (UAS) policy is developed, legal modifications and further regulations are often required for implementation. Typical issues that need to be addressed are:

- The legal basis for the chosen financing instrument: collecting a UAS levy from operators and service providers (licensees), using frequency and license auctions proceeds to finance UAS, developing a new licensing regime with attached UAS requirements, or infrastructure sharing, or any other chosen instrument;
- The legal instruments to apply selected financing or implementation mechanisms (e.g., set up of a UASF, authorize its management and fund disbursement, new licensing regimes and draft licenses);
- Detailed guidelines on UAS policy implementation, UASF objectives or objectives of any other chosen UAS strategy; and
- Detailed regulations, guidelines and principles of the UASF management and operation, if a UASF was chosen.

The precise amount of legal revision that is required, or additional regulation to be implemented, may vary significantly from country to country.

***Box 6.3 Faster Commercial Expansion than UASF Implementation Pace***

In Uganda, as well as in Nigeria, Mozambique, South Africa and many other countries, mobile network development has outpaced the regulator's ability to promote universal access and service (UAS). For example, due to funding and tender delays, half of the communities slated for subsidy in Uganda under the first Rural Communications Development Fund (RCDF) tender had already been reached by the leading GSM operators before tender award had been made. As well, the highly successful Village Phone model of public access had already been rolled out to more than 4,000 villages. Happily, this actually enabled the leading operator to bid the lowest subsidy and saved the World Bank (and ultimately the RCDF) almost 40 per cent of the predicted subsidy. However, because of political instability and insurgency in the north of the country, the RCDF program had an important and relevant role to play in areas not yet served commercially.

Thus there are lessons to be learned which have shown that in many cases, the administration of a Universal Access and Service Fund (UASF) may not be sufficiently agile to actually keep ahead of the market and distribute subsidies to the most appropriate areas. This emphasizes the need for regulators and fund administrators to work closer with operators and include their roll-out plans more strongly into UAS program planning, make special efforts to avoid areas that will be served commercially through normal market forces, and focus on the removal of hurdles to market efficiency.

Source: ICT Regulation Toolkit.

## 6.7. Digital Literacy and e-Inclusion

It is increasingly important that everyone has the support, confidence, skills and equipment to allow them to use the internet and participate in the digital economy. Unless they are able to get online, many will be unable to access the public services, information and entertainment that are a growing feature of everyday life across the world.

Access to the internet has therefore become essential for citizens to play a full part in society. Research in 2009 by PricewaterhouseCoopers showed that those without the internet are already disadvantaged. In the United Kingdom, on average people who use the internet saved £560 a year by shopping and paying bills online and people with basic IT skills earn up to 10% more than their offline counterparts.

In future, UAS may become a question of "e-inclusion", which is the goal of the European Union (EU) declared in the Riga Ministerial Declaration. e-inclusion means both inclusive ICT and the use of ICT to achieve wider inclusion objectives. It focuses on participation of all individuals and communities in all aspects of the information society. e-inclusion policy, therefore, aims at reducing gaps in ICT usage and promoting the use of ICT to overcome exclusion, and improve economic performance, employment opportunities, quality of life, social participation and cohesion.

The Riga declaration recognizes the social consequences of lacking access to ICTs when ICTs have become engrained in all parts of the economy, public and personal life. It stresses actions in the following areas:

- Improve digital literacy and competences;
- Reduce geographical digital divides;
- Use ICT to promote cultural diversity;
- Promote inclusive e-government;
- Use ICT to address the needs of older workers and elderly people; and
- Enhance e-accessibility and ICT usability for people of all abilities, gender and social standing.

E-inclusion policy, therefore, aims at reducing gaps in ICT usage and promoting the use of ICT to overcome exclusion, and improve economic performance, employment opportunities, quality of life, social participation and cohesion. The European Union's Digital Agenda proposes a series of measures to promote take-up of digital technologies by potentially disadvantaged groups, such as elderly, less-literate, low-income persons. Improving access for people with disabilities is another of the policy actions set by the Digital Agenda.

The main reasons why people do not use the internet are increasingly well understood. Europe's *Digital Competitiveness Report* has shown that the main reason for not having internet in the home is the perceived lack of need (38%). Costs for equipment (25%) and access (21%) remain barriers, as do lack of skills (24%). Worries about security and privacy (5%) and physical disability (2%) are less frequently barriers, although they may be significant for some people. Research by Fresh Minds in the United Kingdom has shown that internet non-users are more likely to be poor, to be female, be retired or elderly, have low educational qualifications, or be on welfare benefits.

Developing countries have not yet reached the levels of dependence on ICTs that are current in the EU, but the concept of e-inclusion holds a broader relevance and illustrates the direction of change expected over the next decade.

Many countries have put in place programs in an attempt to improve digital literacy and get more people online. Access to a personal computer (PC) has been identified in many developing countries as being a key part of national digital access programs. For instance, Algeria, the Arab Republic of Egypt, Malaysia, Nigeria and Tunisia have active programs designed to enhance the availability and use of PCs. Both Egypt and Malaysia uses incentives to progress the uptake of PCs - and internet penetration and use - amongst both general and specifically targeted populaces. There are related penetration targets that are generally published by each country, and early indications show that there have been improvements in these rates. In general, the programs rely on financial incentives such as the provision of easy, secure and/or favorable financing terms, lower than market costs, and tax exemptions.

For instance, in 2002 Egypt introduced the PC for Every Home Initiative through its Egypt PC 2010 – Nation Online program. This aimed to reach three million families by the end of 2010 with a particular focus on those with lower incomes. This would represent coverage of over 25% of Egyptian families. This public-private partnership arrangement includes major international ICT companies including Microsoft, Intel, AMD and Via

Technologies. This cooperation is accredited with realizing discounts of up to 50% on the price of hardware, with three categories of PCs provided and a monthly installment program offered.

The Egyptian program, renamed Egypt PC 2010 – Nation Online, has also had improvements made to it that include the introduction of electronic payment, a dedicated call centre service, extended PC warranties, and the provision of loans through normal credit banking procedures.

The Malaysian government announced in its 2008 Budget that it has targeted an increase in the broadband penetration rate to 50 percent of households by 2010 (up from twelve percent in September 2007). In order to help achieve this penetration and make certain that broadband is in fact used, both import and sales taxes will be made exempt from broadband equipment and from consumer access devices (e.g., PCs). Further, a tax deduction scheme will be put in place for employers and employees on the purchase of new computers and the payment of broadband subscription fees.

The United Kingdom is perhaps one of the most advanced countries in its policy of digital inclusion. Like many others it has been attempting to get more people online for several years through its network of U.K. Online Centers. New impetus was given in 2009 with the *Digital Britain Report* focusing on digital participation rather than digital literacy. Digital participation is defined as:

> Increasing the reach, breadth and depth of digital technology use across all sections of society, to maximize digital participation and the economic and social benefits it can bring.

Five stages in the digital participation journey were identified (see Figure 6.4).

***Figure 6.4 The U.K. Consumer Framework for Digital Participation***


Source: Communications Consumer Panel, United Kingdom.

The report announced the establishment of the Digital Participation Consortium, made up of over 65 representatives from industry and the third sector, and chaired by the communications regulator Ofcom. The subsequent National Plan for Digital Participation, published in March 2010, set a target for a 60% reduction in the 12.5 million people in the United Kingdom who are not currently online, with

older people and the less well off a particular focus. To help achieve this reduction the consortium will lead a social marketing campaign and distribute funding for projects to help people get interested in and learn to use the internet.

The views and experiences of consumers are at the heart of the United Kingdom's approach. By putting consumers first, the framework will enable policy makers and service deliverers to:

- Highlight the particular needs of different groups: different groups of people need different things to help them get online and get the most out of the internet.
- Identify gaps and overlaps in current provision: there are lots of different digital participation projects and initiatives being delivered by many different organizations across the country.
- Target new provision: identifying the particular needs of different groups and gaps in current provision will enable new activity to be targeted in a way that achieves the maximum impact with the available resources.

Assess progress: the Framework can be used to assess progress and evaluate activity and initiatives against how well they meet consumers' needs.