Policy Reform and Regulatory Issues in Bridging the Digital Divide through Satellite Technologies

2004

Open and Closed Skies...

Satellite Access in Africa
The publication of this Report – “Open and Closed Skies: Satellite Access in Africa” – takes place during a period of momentous change on the African Continent. Privatisation, strategic liberalisation, and the establishment of separate regulatory authorities are increasingly apparent. Further, national Administrations and regional inter-governmental groups of regulators have begun moving toward harmonised telecommunication regulations and policies. This is in order to facilitate expanded access to voice, data and video services, to help bridge the “Digital Divide”.

Accompanying these trends are numerous technological improvements that are being applied by the private sector to telecommunication systems. Some of these enhancements have resulted in lower-cost digital solutions, and this has begun to have a favourable impact on the extent to which services can be made available to end-users, including those living in both Developing and Least Developed Countries – as well as remote areas.

Satellite-based communications are notable in this regard. Because of their inherent ability to provide coverage of an entire nation or region, satellites are a valuable tool for establishing links throughout the Continent. Even now, Africans who formerly were counted among the “have nots”, are being provided with satellite-based communications, either via stand-alone services or in combination with complementary technologies such as GSM, Wi-Fi and fibre.

This Report examines how satellite-based systems are being successfully provided throughout Africa and analyses key contributing factors, including regulation and policy, bandwidth and systems availability, end-user considerations, and more. Conversely, the Report highlights what challenges remain to be addressed before the full potential of satellite-based solutions can be realised in Africa. As such, the Report serves as a practical guideline for all stakeholders with an interest in expanding African’s access to Information and Communication Technologies.

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Open and Closed Skies: Satellite Access in Africa
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The report also draws upon recent work conducted by the International Telecommunication Union’s Study Question 17-1: “Satellite regulation in developing countries”, the GVF’s “Satellite Policy & Regulatory Guidelines”, a World Bank-funded report conducted by DeTeCon International for the African Virtual University (AVU) on “Low Cost VSAT Technologies and Licensing Regimes”, as well as legal expertise from Squire, Sanders & Dempsey and Coudert Brothers, and consulting by Access Partnership, COMSYS, DeTeCon, DTT Consulting, Euroconsult and Northern Sky Research.
# Table of Contents

**Foreword**
- Page 1

**Map**
- Page 2

**Acknowledgements**
- Page 3

1. Satellite Communications: Bridging Africa’s Last and First Mile
   - 1.1 Project Overview and Summary
   - 1.2 The General Context: Promoting Access to Information and Communications in Africa
   - 1.3 The Potential for Satellite Communications in Africa
     - 1.3.1 Relevant Content and Applications
     - 1.3.2 Affordable and Available Bandwidth
     - 1.3.3 Telecommunication Policy Reform
   - Page 8

2. Satellite Communications: The Tool
   - 2.1 Applications for Satellite Services
   - 2.2 The Demand for Satellite Communications in Africa
     - 2.2.1 African Enterprise: Small, Medium and Large
     - 2.2.2 Domestic and Residential Satellite Demand
   - Page 18

3. African VSAT Regulation Today
   - 3.1 National Experiences in Satellite Regulation and Policy
     - 3.1.1 Nigeria Case Study
     - 3.1.2 Algeria Case Study
     - 3.1.3 Tanzania Case Study
     - 3.1.4 Implications of Three-Country Analysis
   - Page 28

   - 4.1 Optimising the Regulatory Framework
   - 4.2 Strategic Liberalisation in the VSAT Sector
   - 4.3 Liberalisation and Universal Access
   - 4.4 Creating Transparency
   - 4.5 Streamlining Licensing
   - 4.6 Licensing Fees
   - 4.7 Addressing Commercial or Local Presence
   - 4.8 Technology Neutrality and Convergence
   - 4.9 Managing Spectrum
   - 4.10 Optimising Equipment Certification
   - 4.11 Achieving Content Neutrality
   - 4.12 Enforcing Compliance
   - Page 40

5. Global Regulatory and Policy Trends
   - 5.1 WTO: Making Satellite Commitments
   - 5.2 GMPCS-MoU: Implementing The Arrangements
   - 5.3 ITU Radio Regulations: Coordinating Satellite Services
   - 5.4 Tampere Convention: Mitigating Disasters
   - Page 54
6. Toward National and Regional Strategies in the African Context 60
   6.1 Regional Trade, Regional Economy, Regional Policy 60
   6.2 TRASA: Southern Africa: 14 Administrations, One Region 61
   6.3 WATRA: The West African ‘Hub’ 62
   6.4 EARPTO: The Regional-Licensing Opportunity 63

7. Where to From Here? Mapping the Future of Satellite Regulation In Africa 66
   7.1 The European Experience: Harmonising 46 Regulatory Regimes 66
   7.2 CITEL: Harmonising Satellite Regulations in the Americas 68
   7.3 CATIA: Supporting the Development of Satellite Regulation in Africa 68

8. Conclusions 72

Glossary 74
Satellite Communications
Bridging Africa’s Last – and First – Mile

Section 1
Satellite Communications: Bridging Africa’s Last – and First – Mile

1.1 PROJECT OVERVIEW AND SUMMARY

It is now widely recognised that access to information and knowledge through affordable communications represents a significant opportunity for social and economic development, for regional cooperation and integration, and for increasing the participation of people in the emerging global information society. Addressing deficiencies in access to low-cost communication services is therefore now regarded as an urgent imperative for improving the quality of life in African communities, especially in remote and rural areas where the bulk of the population still resides.

But Africa is fragmented into many small national markets, and limited economies of scale have combined with low-income levels to reduce the ability of telecommunication operators to provide services. Compounded by lack of competition in the sector, this has resulted in low levels of investment in infrastructure. As a result, even where access is available, costs often remain extremely high, especially outside urban areas. Although there are a growing number of initiatives to expand terrestrial infrastructure, these are usually confined to the major cities and along trunk routes. As a result, the cost of bandwidth for Internet and other services is generally 10-100 times higher than in North America or Europe.

Fortunately, satellite technology presents an immediate solution to this bottleneck, even in the vast terrain of rural Africa. The IDRC Pan-Africa Satellite Survey that provides the basis for this Report confirms that systems using the new high-power satellites over Africa make it possible to obtain bandwidth anywhere in the region about 10 times more inexpensively than in the past. Prices for some Very Small Aperture Terminals (VSATs) are now less than US$2,000, and monthly charges can be as low as $150 for Internet access. With the economies of scale available from satellites that cover the whole continent, these terminal prices could shrink to $750, and monthly charges to less than $100.

This means that virtually any entrepreneur, small enterprise, public institution or member of the public (via a rural cyber café or telecentre) can immediately get connected, no matter where they are, or how far they are from fixed infrastructure.

But the IDRC Pan-Africa Satellite Survey also revealed that access to low-cost satellite-based services will be inhibited - and in some cases prevented - unless national and regional groups of Administrations apply policies and regulations that more effectively facilitate their use. Many national policies in Africa still restrict the delivery of services through private satellite systems. Although restructuration of the telecommunication sector is now gaining momentum in the region, most countries in Africa continue to be protective of their monopoly national telecom operators. However, the use of satellite can actually be a complement to emerging national and regional backbones.

Currently there are few African regional policies on satellite services and limited regulatory harmonisation. Although a few countries, such as Mozambique, Nigeria and Botswana, have liberalised their satellite markets to some extent, even in these cases, there is often either a restriction on the number of operators or on international traffic, or there are burdensome licensing fees on the equipment.

Many restrictions on private use of domestic and international VSAT solutions unnecessarily thwart access to communications, and national telecommunication regulators need to establish a harmonised licensing procedure for satellite service providers, as has begun to occur in South, Central and North America, as well as in Eastern and Western Europe.

High equipment license fees may have seemed appropriate when satellite terminal equipment cost upwards of $20,000, and bandwidth cost thousands of dollars per month, being mainly used for post and telecommunication organisations (PTOs), multinationals and large corporate branch offices. But now, with terminal prices below $2,000, and subscription fees of $100/month, there are new opportunities for ubiquitous deployment of low-cost satellite services to small businesses and consumers. This means there is an important need to facilitate access to these solutions by implementing “Open Skies” policies, adopting blanket licensing and other regulatory reforms.

To eliminate time-consuming bottlenecks in the submission of multiple license applica-

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1. “VSAT” is an acronym for Very Small Aperture Terminals; the term is used to describe a family of satellite-based one- and two-way systems and applications, where the terminal equipment includes an antenna with a diameter of typically 90 centimetres – 2.4 meters.

2. For point-to-point communications, terrestrial infrastructure is generally less costly than satellite, but for point-to-multi-point applications – including distance education, tele-health and rural communications – satellite communications have been proven to be more cost effective by, among others, the African VSAT Industry. For case studies refer to http://www.gvf.org

3. See http://www.catia.ws

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A busy Internet café in Accra, Ghana (Copyright: Mike Jensen)
Away from home telephone connectivity facilitates "keeping in touch". Photo courtesy of Hughes Network Systems

The regional African regulatory associations, ATOS KPMG, this project is working through lite and other key technologies. Managed by the International Development (DfID) has established a three-year programme called "Catalysis Access to ICTs in Africa" (CATIA) that aims to help expand access to ICTs through satellite. The British Government’s Department for International Development (DFID) has established a three-year programme called "Catalysing Access to ICTs in Africa" (CATIA) that aims to help expand access to ICTs through satellite and other key technologies. Managed by ATOS KPMG, this project is working through the regional African regulatory associations to assist Administrations in their efforts to improve access to low-cost VSAT-based Internet services. The key objectives of this programme, which includes a strong capacity-building component for ICT policy makers and regulators, are to facilitate:

- Minimised satellite regulatory fees;
- Implementation of blanket- and class-licensing;
- Improved type-approval alternatives;
- Enabling the private use of satellite services;
- Eliminating other barriers to rapid deployment of the technology, such as import duties; and
- Creating a one-stop-shop (OSS) for satellite service providers as a single point of contact to provide information about licensing requirements across the Continent and to provide for the submission of license applications with a single electronic application form.

While national policy makers and regulators are the direct beneficiaries of the project, the ultimate beneficiaries will be the general population of Africa who will have much improved access to a variety of services provided via the Internet, especially in rural areas, which have little immediate prospect of obtaining access without the use of satellite. It is expected that by creating better strategies for VSAT deployment, the project will benefit local businesses and satellite operators that supply the services, and consequently national governments that will see improved rural connectivity, increased investment and a stronger tax base. Overall, the achievement of a more consistent and transparent regulatory environment will also help to reinforce the goals of the African Telecommunications Union (ATU) and the New Partnership for African Development (NEPAD).

IDRC is collaborating with DFID in support of the CATIA programme. As part of this effort, the IDRC’s Acacia programme has commissioned the production of this Report, which provides African policy makers and regulators with background information on the regulatory frameworks, end-user applications, cost structures and technical issues pertaining to satellite communications in Africa, and which demonstrates the technology’s potential to address African social and economic needs. In addition, the Report explores effective regulation throughout Africa and other regions, with analysis of how VSAT technology is being used to improve standards of health, education and business.

To provide complementary material for the analysis, a pan-African survey of satellite regulations in Africa was carried out with the collaboration of GVF, and case studies of VSAT-based Internet use in Algeria, Nigeria and Tanzania were commissioned by IDRC from the University of Witwatersrand Link Centre in South Africa. By surveying current uses of VSAT technology and investigating policy issues, the IDRC project aims to develop strategies for potential application of VSAT technology to development issues facing Africa. The Pan-Africa Satellite Survey set out to:

a) Investigate the actual and potential application of VSAT technology for social and economic development, particularly to health, education and business in Africa,

4 CATIA also includes eight other inter-related projects for Africa. These are:
- Robust African Internet backbone with exchange points at the core and strong African ISP associations;
- Well-informed, lively and inclusive policy debates;
- Positive policy environments for the radio broadcasting sector;
- An African-led network of institutions, strengthening the expertise needed to establish ICT-related policy;
- Increased capacity for developing countries to participate in international ICT decision making;
- Development of low-cost computers and open-source software tailored to African markets;
- Stronger network of community radio, FM and public-service radio stations; and
- An Open Knowledge Network, catalysing the creation and exchange of local content.

5 In April 2004 an MOU between CATIA and the Telecommunications Regulators Association of Southern Africa (TRASA) was signed and a joint workshop was held. Another CATIA MOU was signed in May with the West African Telecommunications Regulators Association (WATRA) that was followed by a satellite seminar held in conjunction with the organisation’s Annual General Meeting. As of June 2004, the East Africa Regulatory Post and Telecommunication Organisation (EARPTO) was considering similar action.

6 GVF is an association of organisations involved in the business of delivering fixed and mobile satellite systems and services to consumers, and commercial and government enterprises worldwide. The Forum is independent, non-partisan and non-profit and has a global remit. http://www.gvf.org

7 The Link Centre is an independent research centre hosted at the University of Witwatersrand in Johannesburg. http://www.link.ac.za

8 See http://www.gvf.org
b) Analyse licensing, policy and regulatory issues relevant to VSATs in particular and to wireless technology in general. This includes taxation of VSAT equipment;

c) Investigate available bandwidth at global, regional and local levels, patterns of use of the bandwidth and ownership of VSAT technology in Africa;

d) Explore technical and human resources for deploying services around VSAT technology in Africa; and

e) Examine commercial aspects of VSAT technology including costs to institutions and users.

The IDRC project began in early 2003 with development of survey instruments such as interview schedules, data-collection strategies, and a survey form comprising 33 questions. In September 2003, the questionnaire was sent to every African Administration using correspondents and local researchers where necessary to increase response rates and help obtain accurate details of actual cost structure, regulation and licensing of VSATs in African countries, that would otherwise be difficult to obtain. Information on current satellite regulatory approaches was also procured from:

* Global organisations, including the ITU and in particular the ITU-D Study Question 17-1: “Satellite regulation in developing countries”;

* Regional inter-governmental organisations, such as the Telecommunications Regulators Association of Southern Africa (TRASA); the West African Telecommunications Regulators Association (WATRA); and the East Africa Regulatory Post and Telecommunication Organisation (EARPTO);

* Non-governmental organisations (NGOs), such as the African Virtual University (AVU), Increasing Bandwidth for African University Development (IBAUD), NEPAD, and NetHope;

* Consultants, such as Access Partnership, COMSYS, DeTeCon, DTT Consulting, Euroconsult and Northern Sky Research; and

* Legal experts, such as Squire, Sanders & Dempsey and Coudert Brothers.

This resulted in a substantial body of VSAT regulatory information being obtained from 66% of the countries in Africa and, despite data-collection difficulties in some nations, partial information on the 34% remaining Administrations. In addition, during 2003, three VSAT regulatory workshops were led by the GVF in Lesotho, Nigeria, and Kenya with approximately 90 African regulatory officials from TRASA, WATRA and EARPTO, respectively. These events - as well as follow-up CATIA Workshops held for TRASA in March/April 2004 and for WATRA in May 2004 - provided an opportunity for open-forum discussion with representatives of most African Administrations.

Meanwhile, the GVF is assisting with hosting a VSAT regulatory database where responses to the IDRC Pan-Africa Satellite Survey are housed. This report and the survey results in the online database are made freely available to public- and private-sector stakeholders and will also serve as an information resource at follow-up VSAT workshops and meetings during which policy, regulatory and application issues and opportunities will be discussed. Sub-regional African regulatory groups such as EARPTO, TRASA and WATRA are being provided with the data pertaining to their respective regions in order to enhance transparency and facilitate harmonisation of VSAT policies, regulatory conditions and license application processes.

1.2 THE GENERAL CONTEXT: PROMOTING ACCESS TO INFORMATION AND COMMUNICATIONS IN AFRICA

For the past two decades, most developed countries have witnessed significant changes that can be traced to the use of Information and Communication Technologies (ICTs). These multi-dimensional changes (technical, financial and economic, cultural, social, and geo-political) have been observed in almost all MDGs and exemplified by the several hundred million people within Africa in extreme poverty. Given the challenge and the limited resources available for investment in ICTs for development, private approaches that can be sustainable and self-supporting, or even profitable, have an obvious strategic value. By allowing anyone to set up their own satellite-based Internet communications and information platform, the possibilities for development are exponentially increased.

A second motivating factor is the sheer scale of the development challenge posed by the MDGs and exemplified by the several hundred million people within Africa in extreme poverty. Given the challenge and the limited resources available for investment in ICTs for development, private approaches that can be sustainable and self-supporting, or even profitable, have an obvious strategic value. By allowing anyone to set up their own satellite-based Internet communications and information platform, the possibilities for development are exponentially increased.

At present, however, for the vast majority of the population in Africa, ICTs play little role in their daily lives and have delivered few tangible benefits, especially for impoverished rural and urban communities. The obstacles to ICT implementation include a lack of affordable access, limited local content and useful services, a critical shortage of human capacity to make effective use of ICTs, ill-prepared institutions, and a shortage of public and private investment.

The lack of affordable access to phone and Internet connectivity for the sparsely-scattered majority in Africa, who are not close to even small urban centers, is particularly troubling because, as is well-established, the productivity of poor households must increase if they are to rise out of poverty. Yet increased productivity is difficult without timely access to information, the ability to network and learn from others, or the ability to interact with markets, governments, and other resources.
However, until terrestrial national backbones and networks become much more extensive, unserved areas will need to rely on satellite connectivity. Further, Africa’s vast and often inaccessible terrain makes it prohibitively expensive to roll out traditional wireline networks and implement fibre-optic links in the Continent’s hinterlands. This makes low-cost satellite services attractive, particularly to small- and medium-sized enterprises (SMEs), large organisations - in both the public and private sector - as well as personal users.

ICTs have made it possible to find fast access to, and distribution of, information as well as new ways of doing business in real time at a lower cost. However, a considerable gap exists between developing countries, notably African countries, and developed ones in terms of the contribution of ICTs to the creation of wealth.

The gap has tended to widen between developed countries, the technology suppliers, and the receiving developing countries. At the same time, the gap between the elites and the grassroots communities within these developing countries is also expanding in terms of their access to ICTs. If measures are not taken to make ICTs both affordable and easy to use, access to them will be insignificant in developing countries.

There is now growing interest worldwide in the possibility of using ICTs to help catalyse development and achieve the Millennium Development Goals (MDGs), both globally and within Africa. The recent World Summit on the Information Society (WSIS) underscored the increased importance attached to ICTs. NEPAD is proposing a prominent role for the new Millennium African Technology Agency (MATAg) in this regard. The continent is in the midst of a period of rapid modernisation, with the increased importance attached to ICTs.

The scalability of satellite systems are evident and are inherent in the technology, thus, satellite projects can readily be expanded to serve the growing domestic digital divide in many countries and the extent to which the informal economy, in which most poor people earn their livelihoods, is only loosely coupled to the formal economy. Thus if ICTs are to play a role in poverty alleviation or in achieving most of the other MDGs, there must be a focus on projects or enterprises that directly serve poor communities. This provides strong motivation for using satellite technologies because they level the playing field by allowing even the most remote community access to communications and information as an enabling tool with a multiplier effect that can cut costs and improve the quality of basic infrastructure and services.

The contrast between the amenities and modern lifestyles available in urban cores and the very limited services and lifestyle choices in many rural communities reflects both a growing domestic digital divide in many countries and the extent to which the informal economy, in which most poor people earn their livelihoods, is only loosely coupled to the formal economy. Thus if ICTs are to play a role in poverty alleviation or in achieving most of the other MDGs, there must be a focus on projects or enterprises that directly serve poor communities. This provides strong motivation for using satellite technologies because they level the playing field by allowing even the most remote community access to communications and information as an enabling tool with a multiplier effect that can cut costs and improve the quality of basic infrastructure and services.

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OPEN AND CLOSED SKIES: SATELLITE ACCESS IN AFRICA

impact and the potential for services to be replicated in other locations or contexts.

These considerations draw attention to the potentially significant role of the private sector in development, even in providing services directly to poor communities. Scaling activities to appropriate size, for example, is a skill more often associated with the private sector than with government or NGOs, and profitable business models are what attract investment and fuel growth. By stimulating commerce and development at the bottom of the economic pyramid, in the remote and rural areas, satellite-based communications can have a major impact.

1.3 THE POTENTIAL FOR SATELLITE COMMUNICATIONS IN AFRICA

Increasing universal access to ICTs in Africa is a complex problem. Access to the Internet and other telecom services in Africa has been retarded by restrictive regulatory frameworks, antiquated infrastructure, high fixed costs, and low economic and investment activity. The possibility of providing improved access to the Internet depends on three key areas: 1) Relevant content; 2) Affordable and available bandwidth, which is often but not always related to 3) Telecommunication policies and regulations. Each of these is examined in more detail below.

1.3.1 RELEVANT CONTENT AND APPLICATIONS

For much of the last decade, online content and applications directly relevant to Africa have been limited. But this is now changing dramatically as evidenced by the growing number of African web sites, online newspapers, virtual markets, electronic distance-education facilities and, in particular, the advent of international initiatives such as making the world’s scientific literature freely available to African institutions.

For example, AGORA, a programme of U.N. Food and Agriculture Organisation (FAO) and Cornell University, is now providing African institutions with full text articles of 400 leading agricultural scientific journals, royalty free. Another initiative, HINARI (Health Inter-Network Access Research Initiative), is a program initiated by the World Health Organization and currently provides free access to over 2,100 medical journals to eligible institutions in 38 African countries. Various “bookmobile” projects are also taking off that travel around the country downloading schoolbooks and printing them where needed. It is estimated that 1-2 billion documents are accessible from open web sites and as much as 500 billion documents are available in searchable archives.

This trend has increased the demand for online access, which these initiatives require, and is providing increased motivation to governments and donors to support these types of activities.

1.3.2 AFFORDABLE AND AVAILABLE BANDWIDTH

For much of the Internet era, bandwidth has been a limited commodity in most of Africa, largely because of regulatory hurdles that prohibit competition amongst carriers, capacity constraints of a limited number of service providers, and because the excessive costs of such bandwidth have reduced the demand. Restructuring of the telecom sector is now taking place in a growing number of countries in Africa, and a number of initiatives are beginning to change the bandwidth landscape.

The World Bank/AVU report’s findings are echoed by satellite regulatory surveys conducted recently by the International Telecommunication Union (ITU) and the GVF, both of which found that policies for low-cost “consumer grade” satellite services for Internet access remain unclear in many nations. Government policies are in many cases not keeping up with technological developments, and some countries are still protecting their monopoly telecom operators at the expense of affordable and universally accessible services.

Even in countries where private satellite services are allowed, the license fees are often prohibitively high for consumer and enterprise-class VSAT terminals, particularly when compared to the rates customers in developed countries pay for the same services. Lofty license fees are a major obstacle to Internet development in Africa, where up to 35% of expenditures consist of one-time and recurring VSAT licensing charges. Licensing fees in Africa range between $5,000 and $15,000 per year per terminal on average for a 128-kbps link. Although there is significant progress in reducing both licensing and monthly fees (e.g. Mozambique), the high potential for mass deployment of terminal equipment costing $1,000 and Internet bandwidth at $100/month or less will only be realised if license fees are substantially reduced.

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20 Ibid.
21 See http://www.nethope.org
23 See http://www.itu.int, ITU-D Question 17-1: “Satellite regulation in developing countries”.
24 IDRC Pan-Africa Satellite Survey.
26 See also http://www.researchICTAfrica.org
for parts of East Africa, and it has a spot beam covering Southern Africa and another for West Africa.

At the same time, recent developments in Internet-based VSAT systems have now rendered the technology into a commodity. A central hub can be placed at a location where the upstream Internet costs are lowest (whether in Africa or in other regions, such as Europe or North America), while serving many thousands of low-cost terminals in Africa via satellite using small diameter antennae (0.6 to 1.8 meter) and associated customer-premises equipment, which for enterprise- and consumer-class systems can cost less than $2,000 and $1,000, respectively. This cost can also be built into the subscription fees via a 2-year contract.

One of the key advantages of VSATs is their ability to deliver access quickly. The recent availability of low-cost terminal equipment is helping to encourage this trend. Increased global volumes have driven prices down (see Chart 1), creating options for delivery of a wider range of applications, including rural telecoms, distance learning, telemedicine, disaster recovery, as well as a host of corporate and government applications.

There are already many thousands of public and private African organisations - from banks, stock exchanges and Internet Service Providers (ISPs), to schools, hospitals and rural/semi-urban telecentres - that use VSATs to deliver business, educational and health information. But mass deployment of high-bandwidth VSATs could benefit more of these end users, as well as SMES and individuals that are currently constrained by dial-up connections that are slow, unreliable or non-existent.

Access to competitively priced bandwidth opens a much wider array of opportunities for institutions to make development applications available to users. Larger organisations are already using services at 2 Mbps or more to create virtual private networks (VPNs), and as many of these companies, as well as numerous carriers, operators, manufacturers and value-added resellers provide services in Africa and with headquarters in other regions, have been operational for years and have experienced substantial competitive cost reductions.

1.3.3 TELECOMMUNICATION POLICY REFORM

While developed and developing countries throughout much of the world have begun providing expanded market access to satellite and other telecommunication services as part of their commitment to the World Trade Organization (WTO) Fourth Protocol on Basic Telecommunication Services, most African countries have yet to complete the restructuring of their telecommunications markets. As a result, in most African countries a major hurdle to obtaining bandwidth is regulatory environments that require connectivity to be purchased through the monopoly network operators.

A growing number of Administrations in developing countries have been strategically implementing progressive regulatory reforms that enable their nations to achieve public-policy objectives and bridge the "digital divide," a term that refers to the discrepancy between those with and those without access to communication services in developing and developed countries, as well as the discrepancy within countries. Terrestrial mobile and Internet services are telecom tools that Administrations have focused upon to help achieve this objective. But despite the tremendous gains made with these technologies, large gaps remain.

Terrestrial mobile (cellular phones) has proven ideal as a stand-alone technology for serving large population centres, but reaching remote towns and villages requires backhaul to the public switched telephone network (PSTN). Satellite links are ideal for this purpose. Similarly, the Internet has been established as a valuable resource that promises to equip people with the information tools needed to improve standards of living. But getting access to the Internet is often a non-starter, particularly in developing countries, where only one in 150 people on average have Internet access.

Providers comment that rules are often not transparent, are inaccessible to the general public, and are often difficult to interpret.
While there is a trend in the region to open up the telecommunication sector to competition - and this is beginning to make it easier to use satellite-based services in some countries - there is still little coherence in VSAT regulatory processes across the Continent. Competition within the sector has been introduced in a wide variety of forms, from maintaining full monopolies in fixed infrastructure, to open competition with no unnecessary regulatory impediments to new market entrants. Most countries in Africa are somewhere between, but no two are the same.

This poses a significant challenge: Fifty-four countries and territories comprising a landmass larger than North America or Western Europe cannot achieve the economies of scale currently being realised in unified markets such as the U.S.A., Canada and the European Union. The business case for satellite depends on economies of scale, but in Africa this is frustrated by the lack of harmonisation and continued government protection of the incumbent monopolies.

Where a market is open to full competition, end-users are allowed to transmit and receive data, voice and video signals, not only domestically via a connection to the PSTN, but also internationally. Such a regulatory model for VSAT has been adopted by countries in Asia, Europe and the Americas, however none of the African countries has come this far. In many African jurisdictions, the incumbent is still the only entity that may install and service VSATs or the only entity that may own, operate and maintain VSATs.

While there is currently insufficient satellite regulatory harmonisation in Africa, nevertheless, what may best be characterised as a sea-change has been underway in recent years on the African continent in the way that digital satellite-based communications are being regulated so that they can be provided not only to the “haves” but also to the “have nots”.

Just seven years ago, not a single Administration in the region had liberalised its satellite communications market and, in the few cases where such services were being made available, they were prohibitively expensive to all but the most financially well-endowed enterprises. Today, more than 34 African countries have begun to liberalise the provision of satellite communications and the region now enjoys one of the highest rates of growth in the provision of such services in the world. By no coincidence, key public-policy objectives are being achieved in these countries through increased access to tele-health, distance learning, disaster recovery, business communications for small - to medium enterprises, and more.

As a result, Administrations currently have a valuable opportunity to adapt satellite regulation so that national interests can be advanced - not only for urban areas, but also for Africa’s rural regions where the ITU estimates there is US$3.2 billion worth of annual telecommunication revenue potential (see Chart 2).

In Administrations that have yet to optimise their satellite regulatory regimes, an opportunity cost continues to be exacted that is often paid in the form of missed opportunities in raising standards of health, education and trade. For example, a dozen non-governmental relief organisations - including groups such as Save the Children, CARE, World Vision, CRS and Plan - have joined together to form a non-profit telecom co-operative called NetHope. The company recently approached the Ethiopian Administration for approvals to begin using satellite-based communications for relief purposes, but the regulatory restrictions were so severe that NetHope was prevented from providing services. In the end, the resources were deployed instead in Tanzania and Uganda.

Another example: The African Virtual University (AVU) is a non-profit, African organisation that has begun strengthening access to university education throughout the Continent by providing satellite-based interactive distance learning throughout Sub-Saharan Africa. But, because they plan to offer services in more than 20 nations, they face significant regulatory hurdles in obtaining the necessary licenses from so many Administrations.

To help solve the problem, the World Bank provided the AVU with funding which, in turn, was paid to a consultant to obtain the regulatory information and assess the feasibility of receiving regulatory approvals to provide the educational services. The result was a marathon research effort and the formulation of a
A commercial / legal presence is usually required as a precondition for licence issuance. This can be an obstacle to the effective roll-out of VSAT services, especially in the initial phases, because it increases overhead costs to the private VSAT operators and service cost to the end-users.

Aside from the various restrictions and fees in the countries that permit it, the licence application process for the installation and operation of VSAT services can last from several months up to two years. Providers comment that rules are often not transparent, are inaccessible to the general public, and are often difficult to interpret.

The licensing fees to be paid (including additional taxes, annual operator fees, landing rights, etc.) and the many different licences that have to be obtained - depending on the kind of service to be provided, along with additional end-user earth station terminal licences - can be as complicated as the licensing of public telecommunications networks (e.g. a new fixed or mobile network).

Furthermore, the problem for companies offering satellite services is that, with some obvious exceptions, it is not a viable economic proposition to serve just one or two countries. This usually entails seeking authorisations from a multitude of regulators and satisfying sets of licence requirements and conditions that vary considerably. With the high cost of obtaining all the disparate information necessary and of going through all of the authorisation application procedures, the introduction of services can be delayed by many months if not years. This also creates increased levels of risk, which result in a disincentive to potential service providers to enter the market if there is a prospect that sufficient licences will not be granted in sufficient time, or at all.

While many governments have begun to recognise the benefits of VSAT-based services and adopt regulatory approaches to facilitate their deployment, reaching a regional consensus for policy approaches that would facilitate widespread access to such solutions is still a challenge. In the satellite area, frequency use, network operations, service provision and the use of radio terminals are the main elements that have been the target of a number of regulatory measures (e.g. licensing conditions and procedures), normally meant to help the development of satellite telecommunications and to facilitate market access to satellite providers, but which may also act as market barriers.

These are not the only challenges. From among the aforementioned technological innovations have arisen systems and services - most notably IP-based satellite communications - that require a rethink of traditional regulatory approaches. Domestic vs. international, telecommunications vs. broadcasting, voice vs. data... All these distinctions have now been superseded by the advance of IP-based satellite, which effectively renders all services into one form: data. At the same time, the industry’s competitive structure has also changed at the level of national and international markets: Many PTOs have been partially privatised, as have intergovernmental satellite operators. This concur-
Satellite Communications - The Tool
2. Satellite Communications: The Tool

2.1 APPLICATIONS FOR SATELLITE SERVICES
International telecom services are facilitating the creation of a global economy, where satellite-based systems are used extensively in the developed nations to reduce costs, increase efficiency, and improve productivity. In Africa businesses are also turning to satellite-based solutions, which, being distance independent, make it possible to link the providers of raw materials to agents, to shippers to importers, to retailers and, finally, to consumers in widely-separated geographic areas. As retail demand changes, each participant in the supply chain is able to immediately communicate the adjustments in the supply that are needed.

Indeed, the benefits of satellite-based communications are being realised in every sector of activity, both private and public. From Internet service providers (ISPs), banks, and stock exchanges to schools, hospitals, and rural telecentres, satellite services are being seized upon to elevate economic, educational, and health standards. In turn, higher economic and social standards are attracting foreign investment, creating employment opportunities, leading to increased exports, and yielding stronger hard-currency earnings.

With the advent of higher functionality and lower costs, satellite services can now support a broader range of domestic and international communications objectives than ever before (see sidebar). The global satellite industry supports these services today - according to recent independent research - more than one million VSATs and approximately 650,000 mobile satellite terminals around the world.

The advantage to end users of such satellite-based solutions is that vendors can provide an inexpensive, single communications platform serving an entire nation or, indeed, the region. Meanwhile, global demand for this level of connectivity has enabled satellite communications to rise from being a niche technology to one that is capable of providing the full spectrum of services, from home-use to the mainstream telecommunications service platforms used by many of the world’s largest corporations and governments.

VSAT is not the only tool; it is one of several tools, each of which plays to its respective strengths - fibre and wireless for point-to-point services, mobile for voice and narrowband data; satellite for point-to-multipoint narrow and broadband solutions. While there is no one technology able to effectively serve every application in the African context, voice, fax, data and video have “converged” via VSAT systems to provide users with the flexibility to tailor networks for specific ICT requirements. By interconnecting base-stations even convergence between mobile and so-called fixed line services has been achieved using VSAT-based systems and services.

2.2 THE DEMAND FOR SATELLITE COMMUNICATIONS IN AFRICA
Demand for these solutions arises from two primary user categories. The first is the corporate and government user, which includes banks, retail companies, oil interests, ISPs, and many other types of small, medium and large public and private enterprises. The second are Africa’s individual consumers, entrepreneurs, farmers and traders, most of whom obtain access to VSAT-based communications through cyber cafés and community telecentres. The following sub-sections provide an in-depth analysis of both user categories.

2.2.1 AFRICAN ENTERPRISE: SMALL, MEDIUM AND LARGE
Enterprises that have connectivity requirements in areas where terrestrial technologies cannot provide affordable services are prime candidates for the use of VSAT technologies. However, traditionally the largest use of VSATs has been in developed countries with good terrestrial infrastructure. Enterprises have still found that satellite-based networks provide a more cost-effective point-to-multipoint solution than fibre-optic cables, which are optimised for point-to-point applications. Among these enterprises are the large multinationals, including American Express, BASF, BP, General Motors, Goodyear, L’Air Liquide, Peugeot, Statoil, TotalFinaElf, Visa, Wal Mart and many more.

In Africa, VSATs initially were affordable only to the large PTOs, which used them to provide links in areas where no other infrastructure opportunities existed. But as VSAT prices have declined, enterprise end-user profiles in Africa have become both more numerous and more diverse, as have the types of applications served.

The VSAT enterprise user list is extensive but can be grouped according to the types of ICT services required. Enterprises are basically used by three major enterprise categories in Africa’s telecommunications sector:

1. Telephone carriers, including fixed and mobile operators, use satellites to move (or “trunk”) long-haul traffic between telephone exchanges, along thin routes where terrestrial microwave relays or landlines are unavailable. Even when such infrastructure exists, they often need satellites as back-up capacity. Satellite links may also be used to avoid transit charges and long transmission delays on routes where terrestrial networks do not allow direct connections, or are controlled by competitors. Satellites are also used in rural areas to provide telephone service directly to remote subscribers via satellite systems.

Telephone carriers have long-term needs, anchored in capital-intensive infrastructure and public service obligations to millions of subscribers, but their traffic also tends to grow and may fluctuate more or less predictably, due to shifts in economic conditions or in their subscriber base. Telephone carriers are thus expected to sign leases for satellite capacity typically for five years, with provisions for annual adjustments.

Customers in this sector may have stringent requirements for satellite coverage, since their

32. IDRC Pan-Africa Satellite Survey.
33. COMSYS.
34. GVF.
35. MTBF relates to the average time that elapses between a system failure and, as such, serves to describe product reliability.
36. Satellite market research for this section was provided by Euroconsult, a France-based consultancy specialising in satellite communications and the space industry, http://www.euroconsult-ec.com.
traffic needs to be routed to a broad range of destinations, either directly or through hubs or submarine cables on which they have also arranged for capacity. Carriers may have their own facilities or make their own arrangements for the onward routing of their traffic, based on cost. Many choose to do so on a transatlantic partner with other carriers, and on volume discounts, or they may expect the satellite operator to provide end-to-end connections including fibre network capacity to destinations beyond its satellite’s coverage.

Heavy competition and the rapidly falling price of submarine cable capacity have also made telephone carriers particularly sensitive to transponder pricing, and telephony has been the market where satellite operators have lost the most market share to new fibre-optic networks. However, the satellite links that telephone carriers have retained often provide their only connectivity on certain routes, and as such tend to be of critical importance to their core business—especially at a time when new fibre-optic construction has slowed down or stopped.

**THE SATELLITE/FIBRE COMPLEMENT**

Virtually all telephone carriers maintain satellite capacity to route their trunk traffic. Though most are shifting this traffic to support networks as they become available, even carriers in well-connected territories such as Telkom of South Africa—remain significant satellite users because they need to maintain routes to countries where fibre-optic cables are not available. New entrants use satellites in part because of the onerous terms that incumbent carriers sometimes offer for interconnection.

In the many places where fibre-optic networks do not extend, and may not reach for a long time yet, the high proportion of rural residents in developing countries is pushing up demand for telephone traffic and driving satellite usage. The key region in this respect is currently Africa. Though a long-awaited submarine cable, SAT-3/SAFEX, was connected in 2002 to South Africa and several other African countries on the Atlantic coast, Intelsat’s sales in Africa and the Middle East were stronger in 2002 than in any other region. Intelsat has reported that the volume of its so-called “uncommitted carrier” leases, a category in which its telecommunication customers place their transponder contracts when they prepare to abandon them, was reduced by about half from $3.5 million per month at the end of 2001 to $1.8 million per month at the end of 2002, compared with 32% of its revenue from sales made in previous years.

Despite the profusion of transoceanic cables, satellites with trans-Atlantic coverage, such as Eutelsat’s Atlantic Bird 1 or Loral Skynet’s Telstar 10, are largely, if not totally, booked; SES Americom Inc. is currently procuring two satellites, AMC 12 and 13, largely to address opportunities in the trans-Atlantic market.

The U.S. Federal Communications Commission’s (FCC’s) international circuit statistics indicate that, while overall U.S. carriers became less reliant on satellites for their outward connections in 2001, they still increased their satellite capacity toward sub-Saharan Africa as well as other regions, including the Caribbean, Central America, Southern Asia, and a little surprisingly, Western Europe. For instance, in Africa and the Middle East, satellite usage still grew by 50% or more toward 20 countries, including 14 for which it at least doubled.

Africa’s increased use of satellite capacity alongside growing fibre availability is not unique. For example, although Hong Kong is one of the world’s major submarine cable hubs, its satellite capacity still grew by 66% over 2001-02, and at the end of 2002 satellites still carried over 90% of its traffic to Canada and 32% of its traffic toward destinations other than the 10 largest. Similarly, India’s international carrier Videsh Sanchar Nigam Ltd. (VSNL), while it gained large new submarine cable connections during 2001, also found it necessary to increase its satellite circuit capacity by 6% during the fiscal year ending in March 2002, and it still maintains slightly more satellite than cable circuits.

Having recognised the potential synergy of VSAT- and fibre-based solutions, satellite operators now combine the best of both. One reason has been users’ growing insistence on end-to-end, full-service or “turn-key” solutions, for which they are willing to trust the satellite operators to arrange their terrestrial connections.

It is, of course, in the satellite operators’ interest to have it this way, rather than to see their capacity resold by a terrestrial network provider; satellite capacity retailers have long offered similar hybrid solutions, which draw upon an increasingly rich supply of bandwidth.

Also, since the price of capacity on fibre networks is now an order of magnitude lower than that of satellite capacity, satellite operators may prefer to devote valuable transponder space to routes where they are the only solution, and to lease cable circuits to connect their teleports. Like many other cable users, satellite operators that had considered buying shares in cables have since decided that their continuously falling prices made it more advantageous to lease them.

Recent work done by the IDRC has provided a map of satellite access across Africa. This map shows that the whole of Africa is covered by satellite bandwidth. Altogether, there are 48 satellites pointing 36 Ku-band and 28 C-band beams across the Continent. These can be accessed to provide international and national voice calls, broadcasting, data and Internet services. Some of the telephone carriers, including new entrants, either have begun or are in the process of deploying large satellite networks for rural telephony.

The price of VSATs has dropped rapidly in recent years through economies of scale, with some models costing approximately $1,000. This, along with the relaxation of licensing constraints, could continue to play a key role in serving new markets and sustaining growth. (See Chart 2.)

Satellite Bridge Building

The following are satellite-system features that address the Africa’s operating environment:

- Cost insensitivity to distance;
- Low incremental costs per unit;
- Single-platform service delivery;
- Scalability;
- Upgradeability;
- Low network life-cycle costs;
- Fast deployment (install & commission: 0.5 – 2 days);
- Reliable service: 99.9% for data; 99.5% + for voice;
- Meantime between failure (MTBF) averages more than 25,000 Hours (3 Years);
- Proven in 200+ countries; and
- Unrestricted ubiquitous coverage of large geographical areas by single systems.

Satellite Applications for Africa: A Snapshot

- Internet Via Satellite
- Distance Learning
- Rural Telecommunications
- Telemedicine
- Disaster Relief
- Government Closed User Groups
- National and Multi-National Networks
- Broadband Data Communications
- Multicast VSAT Services
- Intergovernmental and Corporate Applications
- PSTN Infrastructure Extension
- Aeronautical Links
- Land Mobile Communications
- Maritime Services
- News Distribution
- Computer Transaction Services
- Videoconferencing
- Video Monitoring Services
- Database Inquiry Services
- Bank Transactions and ATM Services
- Tourism Reservation Systems
- Distributed Process-Control Systems
- Utility-Monitoring Networks
- Point-of-Sale Electronic Funds Transfer
- E-mail
- Medical Data Transfer and Tele-medicine
- Sales Monitoring and Stock Control
- Satellite News Gathering
- Wide Area and Local Area Networks (WANs and LANs)
- Interactive Multimedia Services
- ICT Embassy Networks
- Stock Market Broadcasting
- Real-time Financial- and Market-Information Distribution
- Digital Audio Broadcasting (DAB)
- Relay of Advertising; and
- Information Provision to Drivers Along Highways.

2. Satellite Communications: The Tool
SATELLITE-BASED MOBILE AND WI-FI

Another means by which carriers are addressing rural demand is through the use of VSATs to provide backhaul links between remote mobile base stations and the PSTN.41 Terrestrial mobile systems have had little need for satellites as long as they remained the expensive attributes of industrialised countries and were used primarily for local calls. However, mobile tariffs have become more competitive, and in developing countries mobile networks have frequently been rolled out and deregulated faster than fixed networks. According to the ITU, mobile lines outnumbered fixed lines for the first time worldwide during 2002, and already did so in 97 countries by the end of 2001.42

Since mobile networks are the only choice users have in many of these areas, they can generate large amounts of the long-distance or international traffic that satellites are well suited to carry. Satellites are in many cases the preferred trunking solution of mobile carriers, since the latter may have difficulties in using terrestrial trunk routes, either because these have been neglected along with other fixed networks, or remain controlled by incumbent carriers.

In particular, mobile telephone trunking appears to have become one of the major drivers of trunker demand in Africa, where, even in early 2003, at least 10 transponders were reported to be in use for that purpose. Major African mobile operators known to rely heavily on satellite trunking include:

* The MTN Group, one of the region’s largest, which this year was using a full PanAmSat transponder and capacity on a New Skies Satellite platform for its operations in Nigeria;
* Celtel (formerly MSI Cellular), which owns GSM networks in 14 countries, acquired satellite uplink operator LinkAfrica in 2002 and was at the time leasing a full Intelsat transponder;
* Vodacom, which uses Intelsat backbones to connect its cellular networks in Congo, South Africa and 18 other countries;
* Telege, an international, a unit of Egypt’s Orascom Telecom, which reported that it controls 40% of the sub-Saharan cellular market and has set up a M-Link Teleport S.A. in Belgium.43

Satellite backbones also form an important part of two large contracts which Vodacom Congo and Nigerian mobile operator Globacom signed with Alcatel in 2002-03 for network expansion.44 A smaller operator in Madagascar, Madacom, recently doubled the capacity of its VSAT network.45

Finally, the strong success of VSAT-based mobile backhaul has sparked increased interest in the use of satellite systems to support a new technology that has important relevance in the African context: Wireless Fidelity (Wi-Fi). As with the need for remote mobile base stations to establish backhaul links to the PSTN, Wi-Fi sites have begun to be paired with VSAT systems for similar purposes. (See Diagram 1 and Chart 3.) Satellite-based mobile and Wi-Fi have already begun to make an important contribution to bridging the digital divide in Africa, as well as in other regions.

2. Internet service providers (ISPs) lease international satellite capacity to connect their servers to upstream Internet connectivity. In a growing number of cases where the regulatory environment is more conducive, ISPs also use satellite systems to provide Internet access to their subscribers in places where the latter do not have access to adequate landlines, either directly, or via local POPs with wireless links to customers.

African ISPs’ adoption of satellite-based services has been swift. According to research by DTT Consulting, in 1998 Africa accounted for less than 10% of the world market for ISP links - the fourth lowest region in the world. Two years later, no less than 47% of African ISPs were linked via satellite. Only Latin America - with 66% - was higher.

Because their traffic tends to grow more rapidly but to be less predictable over the long term, ISPs rarely commit to transponder leases in excess of 1-3 years but may increase their volume every 6-12 months.46 Given the intense competition in their markets, ISPs tend to bargain for low prices even more than telephone carriers, and may expect preferential volume discounts, delayed payment plans and a free trial period for technical testing. ISPs tend to have smaller but more diverse and rapidly evolving networks than telephone networks, and may require more technical support by satellite operators. Finally, ISPs providing direct Internet access via satellite place a premium on transponder power, like television broadcasters, since the size of their antennas and subscriber capacity depend directly on that parameter.

Since most telephone carriers also provide Internet access, they tend to be the principal users of satellite capacity in this market; also, ISPs in some countries are not allowed to procure international capacity on their own.

VOICE OVER IP VIA SATELLITE

A closely-related trend is the growing acceptance of satellite-based Internet telephony, also known as Voice over the Internet Protocol (VoIP). This technology, which can help increase the capacity of telephone networks by compressing and routing calls, for typically 50% of the cost of traditional switched services, also came in 2001-02 to be seen as offering “carrier-grade” reliability.

A growing number of governments have recognised that VoIP, rather than being a bypass mechanism, can help achieve development goals, and this has helped to encourage deregulation. VoIP has now been legalised to some extent even in some of the world’s most tightly regulated markets, such as China, India and South Africa. In South Africa, for example, new licensees are permitted to deliver VoIP from low-density areas, but these had yet to be implemented as of July 2004. In other countries, VoIP is not clearly addressed by regulation, which may prohibit new providers of circuit-switched but not of packet-switched voice services because the latter had not been investigated or was not taken seriously when the law was written.47

The ITU estimates that international VoIP

39 These countries were Algeria, Bahrain, Jordan, Lebanon, Qatar, Saudi Arabia and Syria in the Middle East, and Benin, the Central African Republic, Chad, Ethiopia, the Gambia, Ghana, Liberia, Madagascar, Mali, Senegal, Sierra Leone, Somalia, South Africa and Swaziland in Africa [C. Hsu, “MTN Nigeria Uses New Skies Satellites platform for Inter City Telephony and Internet Development”, ITU World Telecommunication Development Report, International Telecommunication Union, Geneva, Mar. 2002, p.13].
41 IDRC & CATIA. Open and Closed Skies: Satellite Access in Africa. See www.idrc.ca/accia or www.gv.org
42 Euroconsult.
traffic accounted for 7.3% of international outgoing minutes as far back as 2001. TeleIP traffic would double during the year, to 18 billion minutes. The lower deployment cost of packet telephone lines makes these services highly attractive, as carriers face increased competition and the need to provide expanded access to ICT solutions.

Internet telephony has been a significant satellite application since 2000, when closed-user-group VSAT networks began providing telephone services, with their other data traffic. Trunking via satellite offers natural advantages to VoIP in countries with limited backbone capacity where it is sold as a cut-price service, or used by new entrants as a way to quickly begin providing services.

In Africa, VoIP also has important implications for expanded access to services provided in cyber cafes. In a proprietors’ survey conducted for this Report, 80% of those interviewed in Nigeria reported that voice was a growth area for international calls. Call charges using traditional networks are perceived as too expensive, resulting in high demand for Voice-over-IP. For example, at a cyber cafe it costs 20-30 Naira (US$0.16 - 0.23) per minute to call a fixed-line telephone in the U.S.A. The cost of a local fixed-line call, by contrast, is estimated to be 35 Naira (US$0.26). The downward pressure this is exerting on international call rates is helping to push the incumbent fixed and mobile PTOs to reduce their rates as well, often by adopting the same technology. In April 2004 mobile operator M-tel dropped its international call rates to 50 Naira/minute (US$0.37).

For satellite operators, VoIP is still a marginal source of demand for capacity but can be bundled with other applications such as distance learning and/or can become a source of call-termination revenue.

3. Corporate networks are maintained by companies in a wide range of industries for their internal communication needs, either by themselves or outsourced from service providers, and they use satellites to connect branch offices, factories or points of sale with each other or to centralised headquarters. Applications in this market include everything from videoconferencing to delivery of promotional videos to points of purchase, and from credit card authorisations at teller machines or supermarkets to cashiers to telephone service to connectivity for offshore oil platforms. Demand for Internet access has also figured prominently as an application. Between 1998 and 2000, demand for Internet services emerged as the dominant driver in VSAT-purchasing decisions worldwide (See Chart 4).

Apart from the lack of terrestrial networks in their areas of operation, users in this market are usually eager to turn to satellites because the data they handle, such as price lists, must be delivered simultaneously to their branch offices, or to avoid the complications of relying on multiple and disparate terrestrial service providers. Consequently, demand in this segment often arises even in areas well served by fibre-optic networks. The largest installed bases of VSATs currently are in the United States and Europe, where the automotive, retail, financial-services and government-communication sectors are major users.

In Africa, corporate users include banks and stock exchanges (including virtually all banks in South Africa and more than half of the banks throughout Africa); retail companies (such as JD Group in Southern Africa); and the oil, gas and mineral industries (such as Ashanti Goldfields, DeBeers, Shell, etc.). Direct On PC, Nigeria provides a good example of the extent to which companies need VSAT services in the African context: Beginning in 2001, during 18 months, the company grew from five employees with 9 MHz of space segment providing 4 Mb of VSAT-based Internet backbone service in Lagos, to 100 employees, with presence in 85 cities, and 800 satellite-service customers, including Texaco-Chevron, Nicon Hilton, Aliba Sheraton, Michelin, Alan Dick & Co., Con Oil, not to mention dozens of cyber cafes. Similarly, IwayAfrica’s Ku-band service has seen similar growth over the last two years, with 700 VSAT terminals spread across Tanzania, Uganda, Angola, Nigeria, Ghana, Cameroon and Gabon.

The companies that maintain VSAT networks tend to procure satellite capacity through resellers or service providers rather than directly from satellite operators. Transponder leases in this market are generally small and rarely exceed terms of five years. Service quality tends to be a key consideration since applications, for instance in the banking sector, can be extremely intolerant of outages, and high-power satellites are generally preferred since they allow the use of smaller VSAT antennas.

4. Governments increasingly are using satellite services to provide expanded access to their citizens to ICT and Internet services, regardless of their geographical location. A particularly important aspect of this growth is for the development of rural telephony and e-governent programmes, which are expected to have a compound annual growth rate of some 18% over the next 10 years. (During an ITU Roundtable on Least Developed Countries held in Arusha, Tanzania on 3-4 April 2003, half of the Administrations in the programme had developed plans to launch VSAT-based solutions for rural areas.)

African governments have also begun developing programmes to support nation-wide administrative networks, often assisted by development agencies. Many of these face considerable cost and availability barriers in utilising existing terrestrial telecommunication networks in areas outside the capital cities, and are finding a low-cost VSAT option to be ideal for linking remote institutions. Priority areas include larger administrative centres located outside the capital cities, such as provincial government offices, customs authorities, national research centres, the municipal authorities, police stations and major hospitals and clinics. Nigeria is establishing a VSAT network for linking remote institutions. Priority areas include larger administrative centres located outside the capital cities, such as provincial government offices, customs authorities, national research centres, the municipal authorities, police stations and major hospitals and clinics. Nigeria is establishing a VSAT network for linking remote institutions. Priority areas include larger administrative centres located outside the capital cities, such as provincial government offices, customs authorities, national research centres, the municipal authorities, police stations and major hospitals and clinics.
to link its local authorities, and regional bodies such as the West African Economic Union (ECOWAS) and the Southern Africa Development Community (SADC) Secretariat in Botswana, for example, are developing plans for networks to link their focal points to the Internet in their regions.

5. Education - There is also considerable demand for Internet access in the tertiary-education sector, particularly outside the capitals and amongst the libraries, secondary and primary schools. Although this sector is chronically under-resourced, a number of governments and NGOs have already committed to improving school connectivity - such as the NEPAD programme, which aims to link 700,000 African schools, many via satellite - and a variety of development agencies are supporting initiatives such as the World Bank’s Worldlinks programme which is active across the Continent.

Other examples of satellite-based educational programmes with development-sector support include:

* As noted in the Introduction of this Report, the Kenya-based African Virtual University (AVU) has established satellite-based links for universities in more than a dozen African nations and plans are underway to upgrade the network with two-way VSAT-based systems. The AVU’s goal is to use ICT in sub-Saharan Africa to enhance access to quality higher education. The World Bank, which provided funding for the programme, describes AVU as a “university without walls”; 30 learning centres in 17 tertiary institutions across Africa have been established. By 2002, about 3,500 hours of instructional programmes had been provided and more than 24,000 students had registered in semester-long courses. The satellite-based network offers AVU the most cost effective means of reaching vast numbers of learners at one time.

* Schoolnet Namibia has financing to connect 33 off-grid schools this year, and 135 more over the next two years. For some of these, it is anticipated that a terrestrial wireless connection will be provided, but it is expected that approximately 300 schools will need to be connected via VSAT over the next couple of years, using financing from other sources.

* A project to substantially improve access to bandwidth for African Universities is being discussed by a variety of international development agencies including the IDRC, the ITU, the Open Society Institute (OSI), and the Rockefeller, Ford, MacArthur and Carnegie foundations. The project aims to bring high-speed Internet bandwidth to African tertiary institutions and research agencies so that they can more easily collaborate with their counterparts in Africa and around the world, and to access the world’s scientific literature at rates similar to those enjoyed in developed countries (see Table 1).

* Nigeria is currently developing a project that the World Bank may fund to support the National Universities Network (NUNet). A World Bank feasibility study recommended that NUNet should consist of a network of 40 VSATs. A consultant is now being hired to develop the plan, which also includes all tertiary institutions in the country, as these have now been invited to join NUNet. UNESCO is also to begin planning for a national tele-centre programme in Nigeria.

* The U.S.-based Global Catalyst Foundation is providing Internet access for sites in western Tanzania (near Kigoma). It is working with the UN High Commission for Refugees (UNHCR) and other NGOs to set up computer/Internet centres in a UN refugee camp for Burundi refugees, a local Tanzanian teacher training college, and a local vocational school.

* U.S.-based Development Partners for Twenty-First Century Africa (DEPTA) is in the process of developing a plan to establish Internet connections in rural Cameroon not only for schools and libraries, but also for churches and other public institutions.

6. Public access - Provision in underserviced areas is another government satellite application in some countries. The PTOs of South Africa and Ethiopia have rolled out large VSAT networks for village communications projects, while plans are underway for new programmes: U.S.-based Greenstar is rolling out remote integrated public access facilities in Africa, which currently use Inmarsat phones for voice and data. And the Government of Nigeria is planning a national, state and local intranet and series of rural public access points with VSAT capability where such communities can have access to IT, the Internet and information on government programs, local news.
and weather details, land and related administrative records, government license and online applications, local commodity prices and online transactions.

7. Development sector users have strong needs to obtain connectivity with offices and colleagues in their home countries and often maintain administrative offices in remote areas. Low-cost VSAT options are already deployed in more than a dozen African nations, and further links are in demand.

Investment in the sector by the international development and aid community is increasing. The potential of ICTs to transform development is receiving worldwide attention and NGOs, corporations, national governments, and global compacts such as the UN and the G8 are all marshalling resources to use ICTs for improving development in regions like Africa.

Development agencies, NGOs and national governments have indicated their immediate needs for VSAT services. Many of these are for traditional C-band (4-6 GHz) services. The following are a sample:

* USAID’s Leland programme is upgrading its VSAT facilities in the capital of Eritrea, Asmara. It is also formulating policy for deployment of low-cost VSAT for many of its projects in other African countries, in particular, within the PAS10 footprint area, in Lesotho, Swaziland, Rwanda, Mozambique, and Mali.

* FAO based in Rome is presently developing plans for the provision of connectivity to hundreds of its remote and isolated in-country partners in Africa.

* As noted previously, a dozen non-governmental relief organisations - including groups like CARE, Save the Children, World Vision, CRS and Plan - have joined together to form a non-profit telecom cooperative called NetHope, which has already begun deploying satellite-based solutions throughout the African continent.

* IDRC is supporting the use of VSAT with Wi-Fi to enable NGOs and telecentres to amortise the high cost of bandwidth by extending service into the neighbourhoods in Angola and Mozambique as part of its ‘FirstMile-FirstStop’ local connectivity research network in southern Africa.

* SNV (Netherlands Development Organisation) and the International Institute for Communication and Development (IICD) in the Hague plan to provide Internet access to rural community radio stations in Burkina Faso via satellite.

### 2.2.2 DOMESTIC AND RESIDENTIAL SATELLITE DEMAND

Once only accessible by enterprises, VSATs are now able to address smaller-scale requirements, due to increased sales volumes and greater economies of scale which have led to price decreases. Further, higher-powered satellites have begun to allow the deployment of smaller remote terminals, bringing the equipment cost within reach of more wealthy African households and other members of the public via cyber cafés and community telecentres.

Satellite-based services made their first major inroads to consumers via receive-only Direct-To-Home (DTH) services, which have competently succeeded with cable and other terrestrial infrastructure in urban and suburban markets for more than a decade, as well as providing services to rural areas. In 2002, there were some 55 million DTH subscribers worldwide, representing 13% of the total pay-TV market. Terminals in some markets are now provided for free as part of annual programming packages. Subscriptions, meanwhile, are projected to exceed 100 million by the end of this decade. This growth reflects the continuing advantages that satellites offer in terms of subscriber reach and capacity for carrying large numbers of channels.

More recently, the satellite industry has also begun rolling out two-way satellite services to consumers, which enable the provision not only of domestic ICT requirements, but also of international telecommunication services (see Figure 1). Like DTH services, two-way satellite solutions are extremely cost effective in point-to-multipoint applications, a fact that also applies in the consumer context. This derives largely from satellites’ inherent cost insensitivity to distance, as well as to population density.

Professional employees in the diplomatic sector, large corporations, expatriates and the upper echelons of government either have or would like to have - Internet access in their homes and have demonstrated a willingness to pay for access to even a slow dial-up connection. Satellite-based DTH TV and Internet-access penetration rates provide a measure of potential demand for these services: The DTH market is currently about 450,000 subscribers in South Africa and 150,000 throughout the remainder of the Continent, where there are also a variety of cable and terrestrial / analogue pay-TV services. DSTV is currently delivering a bouquet of more than 100 channels to homes and hotels throughout Africa for $30-$50 (not including a $150 decoder). If just 2% of the South African and 1% of Africa’s other DTH subscribers obtained a low-cost VSAT service in the first year, this would represent more than 10,000 units.

Alternatively, in the overlapping Internet-dial-up user base, there are about 1,000,000 subscribers in Africa outside of South Africa; if only 1% of these were to use VSAT, this would represent 10,000 sites. Again, a higher proportion of South African subscribers might purchase a VSAT-based service; at 2% of existing IP service users, this could translate to another 15,000 sites.

### THE AFRICAN CYBER CAFÉ MARKET

While most telephone shops are in urban areas, a growing number are being established in remote locations. Many are now adding Internet access to their services, even in remote towns where it is a long-distance call to the nearest Internet dial-up access point. In addition, a growing number of hotels, lodges, backpackers and other public venues provide a PC with Internet access.

Current market assessments of cyber cafés and Internet use in Africa are virtually non-existent. Most public access facilities do not use cyber-café management software, and it is not possible to track the use of Hotmail and other Web-based email accounts obtained via a shared dial-up connection. However, there are probably in excess of 20,000 public Internet access points in Africa serving more than 2 million customers. The majority of public access Internet points are small independent operations with two or three PCs, which augment revenues from other sources.

There are also some initiatives to start larger scale cyber-café franchises such as Busylinternet Ghana Ltd., a partnership between Ghanaian investors and a U.S.-based technology company, that has established a large cyber café in Accra as the first in a series of Internet centres across Africa. These centres will provide individuals and businesses with the expertise and resources needed to promote and expand their traditional businesses into e-commerce and other Internet-related activities.

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58 IBAUD.
59 Futron Corp. See http://www.futron.com
60 IDRC Pan-Africa Satellite Survey.
Each centre (otherwise known as incubators) consists of three areas: a 60-seat learning centre for workshops and seminars, an access area with 100 computers for public Internet access, and 4,000 square feet of office space where small businesses and organisations can develop mobile programmes and products. With potential to launch further centres, Busystart could spread across Africa, creating a network where participants and businesses can share best practices and help each other exploit "digital opportunities".

In Egypt, MenafNet has launched the first of a series of branded I-cafes. The model being franchised across the country with at least 10 envisaged for Cairo. The 10-PC centre charges 10 Egyptian pounds ($2.38) per hour for ad-hoc Internet use. Ten pre-paid hours costs 9 Pounds per hour ($2.14) and 20 hours prepaid costs 8 Pounds per hour ($1.90).

Surprisingly, there are no major commercial cyber cafés or chains operating in South Africa. There are a few small branded cyber cafés hosted in or near coffee shops and malls in the upper income areas around major cities, especially in areas popular with backpackers - Johannesburg, Pretoria, Cape Town and Durban. A number of hotels, most notably the CityLodge chain, have begun to install Maginet.Net Internet access facilities in hotel rooms. Most of these hotels are paying significantly more for their leased-line connections for Maginet.Net, so these become an immediate prospect for provision of service.

In Nigeria, Tepephone has a national payphone and cyber-café license, which costs 500,000 Naira for five years (approximately $250,000), and operates 600 payphones and 17 cyber cafés in Lagos. Each cyber café has an average of 20 workstations and Internet access prices are 10 Naira per minute ($0.0543 per hour). Tepephone also has a university "campus strategy", which will see it deploy 50-PC cyber cafés in universities, charging 5 Naira per minute ($0.27 per hour). Interestingly, Nigeria is one of the few countries in Africa where cyber cafés are allowed to promote VoIP, which many do.

Most of the smaller cyber cafés in Africa use dial-up access, while some of the larger ones operate using 64-Kbps or 128-Kbps leased lines. Where regulations allow, cyber cafés in remote areas have been quick to adopt the new one minute ($2.7 per hour). Interestingly, Nigeria is one of the few countries in Africa where cyber cafés are allowed to promote VoIP, which many do.

Most of the smaller cyber cafés in Africa use dial-up access, while some of the larger ones operate using 64-Kbps or 128-Kbps leased lines. Where regulations allow, cyber cafés in remote areas have been quick to adopt the new technology. The more relaxed restrictions on receive-only satellite have also resulted in increasing numbers of cyber cafés cutting connectivity costs and improving download speeds by using simplex Ku-band (10-20 GHz) satellite broadcast networks to receive data, while transmitting via a low-speed dial-up connection or analogue 33-Kbps leased line. Infosat and Siyanda (Southern Africa), Mweb Nigeria and MenafNet (North Africa) provide these services, which increase download speeds to 300-400 Kbps.

Given the higher costs of almost any other solution for the average cyber café, the market for low-cost VSAT in this sector is likely to be substantial. There are approximately 3,500 African towns and urban areas with 1,000 or more people, according to World Gazetteer. If hotels and other lodging and public venues are included in the estimate, then many thousands of new potential VSAT sites across sub-Saharan Africa would not be unrealistic, assuming regulatory impediments are overcome and this does not include standalone kiosks placed in public locations, which are being installed in Europe by France Telecom.

AFRICA’S CYBER CONSUMER: A PROFILE

To understand more clearly who uses African cyber cafés, during 2003-2004 the IDRC Pan-Africa Satellite Survey enlisted the Link Centre to carry out interviews and administer questionnaires to more than 1,200 customers of 40 cyber cafés located in 33 districts throughout the capitals of three countries: Algiers, Nigeria and Tanzania*. In order to compare cyber-café users in urban versus non-urban areas, a targeted survey was also conducted of 194 users in Mtwara, a relatively poor, remote Tanzanian town near the Mozambique border.

Through the on-site research it was revealed that, for most African consumers, the cyber café is their primary or sole form of access to communications. Cyber-café consumers who have an Internet connection at home were only 12% of those surveyed in Lagos and 18% in Algiers. Interestingly, there was a higher percentage of consumers who had an Internet connection at home in remote Mtwara (14%) than in the city of Dar es Salaam (11%).

Another key means of obtaining Internet services was via access to a working computer at school and/or work. In Lagos, 62% of cyber-café consumers also had access to a working computer at school and/or work, with 32% also having an Internet connection, which on average was used for six hours per week. In Algiers, 34% have access to a functional computer at school and/or work, with 31% having Internet that was used for approximately six hours per week. In Dar es Salaam, 32% have regular and 47% occasional access to such a computer; 36% to Internet, and on average they spend four hours per week on-line; only 23% of Mtwara consumers had access to Internet at school or work.

What is also striking about African cyber-café consumers is not only the extent of employment, but also the relatively high levels of education and income.

* Employment: More than 60% of cyber-café consumers in Lagos were engaged in full-time work and almost 10% on a part-time basis, with scholars and students accounting for 19% of all consumers. In Algiers, 56% were scholars and students, while 24% were working full-time and, like Lagos, nearly 9% were working part-time and 2.5% were unemployed. In Dar es Salaam, 43% were employed (vs 60% in Mtwara), 36% were scholars or students (vs 23% in Mtwara) and 7% were unemployed (vs 17% in Mtwara).

* Education: 72% of Lagos cyber-café consumers are completing or have completed tertiary education and 13% are either attending or have completed a secondary school. In Algiers, the comparable percentages were 83% and 17% respectively. In Dar es Salaam the composition was 43% and 51%, and 20% and 32% respectively.

* Disposable Income: Consumers spent a monthly average of 4,179 Naira ($103.15) in Lagos, 1,720 Dinars ($23.89) in Algiers and 16,657 Shilling ($318) in Dar es Salaam on cyber-café services. Mtwara consumers spent a monthly average of 1,079 Shilling ($19.97) on cyber-café services.

64 GVF. The website for the global satellite communications industry association, located at www.gvf.org, receives more than 13,000 hits per day on average from throughout the world. Of all VSAT pricing requests received by the organisation, the single largest user type is African cyber-café owners.
65 For more information on companies that provide systems based on the DVB-RCS open standard, or satellite-based DOCSS, or a variety of proprietary VSAT technologies go to http://www.gvf.org
Open and Closed Skies

2. Satellite Communications: The Tool

The fact that the distribution of the cyber-café consumers was highly skewed in favour of scholars and those involved in full-time employment may be related to the financial capability and/or appreciation of the different technologies used to support services used by these consumers.

The Survey showed that individuals highly value the speed of Internet links - and are willing to pay for more. Respondents were asked whether they would pay more money to go to a cyber café which is no further than a faster Internet connection. In Lagos, 80% of Algiers, 79%, Dar es Salaam, 74%, and Mtwara 21% of consumers reported that they would pay more money for speedier access. Speed was said to be essential, as it saved money and reduced frustration. Among those surveyed, a minority of cyber-café consumers in Lagos, Algiers, and Dar es Salaam used the cyber café closest to their home or school/work. The remainder travelled an additional 15 minutes in Lagos, 18 minutes in Algiers and 17 minutes in Dar es Salaam to use a different cyber café. The reasons given include access to faster connections and superior hardware.

Finally, respondents were asked whether they were interested in knowing the operational system used by their cyber café. Most had no idea how the cyber cafés they patronised were connected to the network (in Lagos -69% of Algiers - 70% and Dar es Salaam - 93% did not know). However, based on focus groups and in-depth interviews with cyber-café consumers that relied upon VSAT-based services, once a cyber café implements satellite technology, regular consumers find out quickly and tend to form a positive opinion regarding the connection speed and quality of service.

One of the questions in the cyber-café survey aimed to identify obstacles preventing consumer utilization of the Internet. In Nigeria 55% of respondents cited a lack of time as the major constraint, which ties in with the high levels of frequency compared to Algiers and Dar es Salaam. In essence, this establishes a cap on the amount of cyber-café usage that we can expect from an existing user, as the market matures. While it is unlikely that all potential consumers utilise cyber cafés in Nigeria, it is likely that there is still a potential market that could be tapped into should prices and quality move towards both better affordability and accessibility. Future research also needs to look at the age entry and exit levels of consumers in Nigeria, for this study showed a late adolescent entry level and early post-middle age exit level. Targeting consumers on either side of this spectrum may well result in an increased consumer market.

The greatest frequency of weekly visits in Algiers is two days (24.9% of respondents). This would seem to reflect increased costs (local telephone call prices recently were increased 355%), as well as decreasing use of the Internet in comparison to networked games. The question is how this is going to change given the deregulation of VoIP. Indications are

| Table 2: Cyber-café Consumer Activities in Dar es Salaam vs. Mtwara |
|--------------------------|--------------------------|--------------------------|
| Factor | Dar es Salaam | Mtwara |
| Length of trip to cyber café from home or school or work (shortest) | 28.9 minutes | 11 minutes |
| Number of days per month that cyber café is used | 12.3 days | 14.4 |
| Change in usage during previous six-months | 27% increase | 28% decrease | 33% increase | 13% decrease |
| Average monthly expenditure at a cyber café | US$ 10.30 | US$15.28 |
| Increase in expenditure during previous six-months | 23% increase | 16% decrease | 35% increase | 13% decrease |
| Knowledge of operating system | 22% yes | 7% yes |
| Additional amount willing to pay for better service | 20.8% | 13% |
| Potential monthly expenditure for better service | US$ 12.43 | US$17.40 |

| Table 3: Dar es Salaam vs. Mtwara, Tanzania Cyber-café Consumers |
|--------------------------|--------------------------|--------------------------|
| Dar es Salaam | Mtwara |
| Gender composition | 64% male | 36% female | 55% male | 45% female |
| Average age | 28.7 yrs | 29 years |
| Education Level - completed | 32.3% secondary | 19.5% tertiary | 51% secondary | 43% tertiary |
| Vocation - employed | 23% students | 60% employed | 36% students | 43% employed |
| Personal mobile telephone, ownership | 58% |
| Personal mobile telephone, monthly expenditure | US$ 20.19 |
| Household fixed telephone, ownership | 34% |
| Fixed telephone, monthly expenditure | US$ 26.45 |
| Personal computer home ownership | 22% | 36% |
| Internet connection at home | 14% | 11% |
| Use of computer at school / work | 27% | 32% |
| Internet connection at school / work | 23% | 36% |
| Average time spent on Internet at home and school / work | 19.8 hrs | 5.1 hrs |
(based on anecdotal evidence) that it will benefit cyber cafés because of the large numbers of expatriate Algerians in Europe. Indeed, there is a possible connection between those countries that have a large diaspora and Internet usage. Certainly, current research amongst immigrant communities in Ireland is beginning to show such a correlation.

Dar es Salaam has experienced sharp growth over the last few years in cyber café usage. The complaint of many consumers and users (in interviews) is that bandwidth prices are not decreasing. The conclusion is in part that because of the lack of investment in local infrastructure such as an IXP and local VSAT hubs (though an IXP has recently been implemented the benefits are still to be felt).

These results, combined with the fact that more VSAT-related inquiries are currently received from African cyber cafés than from any other region, suggest that VSATs could play an important role in broadening access for ICT users by cutting costs and improving speeds. The Link report concludes by observing “What is striking is the similarity in the usage trends, and although these findings are limited they do indicate that a similarity in demand that is driven by the need for affordable, reasonably fast connectivity. If VSAT is able to do this more effectively, this is what they want.”

The VSAT industry, meanwhile, is moving to address consumers’ requirements, as well as demand from SMEs and SOHOs. Massive satellite system rollouts are underway this year, and service providers have begun placing sizeable orders for terminals to be deployed commercially in Africa, as well as in the Arab region, the Americas, Asia, North America and Europe. More than 100,000 low-cost consumer-class “DOCSIS”-based units have now been ordered - 30,000 of which are to be deployed in North Africa - and thousands of open-standard “DVB-RCS” earth stations are also slated for delivery. The new family of VSAT products can be expected to result in terminal costs continuing to be driven down by mass-manufacturing processes, setting the stage for expanded access to satellite-based ICTs... assuming that Africa’s regulations facilitate their deployment.
African VSAT Regulation Today
African VSAT Regulation Today

3. AFRICAN VSAT REGULATION TODAY

A growing number of African Administrations have begun to implement policies and regulations that seek to open telecommunication markets to varying degrees of competition. These policies are being applied to telecommunication structures that, on one level, have traditionally been remarkably uniform. Without exception, the sector of each African country has been organised on the principle of national operating entities having responsibility for providing telephone service. In some cases, international links were - and in some countries still are - the responsibility of a separate entity. Government ownership of operating entities has been the norm.

This strategy has steadily evolved over the last decade, and in many African countries today, standard practice is widely perceived to include the following elements:

- Separation of regulations from ownership and operations under a new legal framework;
- Separation of posts from telecommunications;
- Privatisation of incumbent operators;
- Statutory monopoly in public switched fixed telephone services;
- Joint ventures by the incumbent in other services (e.g. mobile and satellite services);
- Open competition for equipment supply and value-added services.

International experience indicates that elements of the reform process may be combined in a variety of ways. For example, the United Kingdom and United States initiated market entry and privatisation of their incumbent operators at a relatively early stage, thereby intensifying pressures on British Telecom (BT) and AT&T, respectively, to become more commercial and efficient. New regulatory arrangements were put in place to facilitate and reinforce these policies.

In France and in Germany, as in most other European countries, the strategies concentrated on commercialisation of the telephony business, with liberalisation and regulatory reform being related mainly to new and ancillary services. The incumbent operator was allowed to undertake internal reforms at its own pace, with the boundaries of its monopoly carefully redrawn before it was fully exposed to market forces. The last area opened to competition was the main telephony market.

To date only three African countries have officially introduced competition in their fixed-line markets - Ghana and Uganda licensed second network operators some years ago, and in Senegal open competition was introduced in July 2004. South Africa officially instituted a duopoly in fixed line services in 2003, but delays in licensing the Second Network Operator have meant that competition is not expected until late 2004. Tanzania is expected to introduce competition in February 2005.

Meanwhile, most Administrations in the Americas and Europe have fully liberalised their VSAT markets, where end-users are also permitted to transmit and receive data, voice and video signals in order to connect facilities in the local market, as well as throughout the world. The situation in Africa is different. African countries have generally tended to follow Continental European rather than U.K. or U.S. precedents and have restricted the connection of private networks or closed user groups to the PSTN. This regulatory dynamic has major implications for VSAT regulation in most African countries, where satellite-based networks are increasingly a feature of telecommunications markets but are not permitted to connect to the PSTN. In countries where such a connection would theoretically be permissible, additional licence or ‘by-pass’ fees have to be paid, although in practice such a concession is very difficult to obtain.

In some African countries that have adopted a liberalised regulatory framework, private VSAT networks are allowed to function under the authority of the incumbent operator, while the latter still retain a formal monopoly. There is also usually a limitation on the provision of voice services.

Another common restriction in Africa involves limiting private VSAT networks only to domestic use. VSAT network operators may be required to route their private network transmissions through the national hub of the incumbent operator, regardless of the financial or even the technical disadvantages this may have for private VSAT network operators. In some cases, obtaining a VSAT licence may require a bilateral arrangement with the incumbent operator with a “landing-rights fee” or tariff to be paid to the operator, even if the incumbent does not participate in the service chain. In other monopoly jurisdictions, the incumbent is the only entity that may install and service VSATs or the only entity that may own, operate and maintain satellite earth stations.

A commercial/legal presence is typically required in Africa as a pre-condition for licence issuance. This can be an obstacle to the effective roll-out of VSAT services in the countries concerned, because it increases overhead costs.

66 DeTeCon International “Study on Low Cost VSAT Technologies and Licensing Regimes” for the World Bank and African Virtual University
67 IDRC Pan-Africa Satellite Regulatory Survey.
69 The Nigeria, Algeria and Tanzania case studies were commissioned by IDRC from the University of Witwatersrand Link Centre in South Africa. The Link Centre is an independent research centre hosted at the University of Witwatersrand in Johannesburg. http://www.w.link.ac.za
to the private VSAT operators and inflates prices to the end-users”. And finally, in a number of African countries, rules are often not transparent and are inaccessible to the general public. The licence-application process can be extremely complicated, including processing periods that require up to two years, payment of a wide variety of fees - including additional taxes, annual operator fees, landing rights, etc. Added to licensing fees are customs duties, which are often so high as to prevent cost-effective access to VSAT equipment.

The following sections examine in greater detail how African Administrations - as well as their counterparts in other regions - are optimising satellite regulation through initiatives at the national, regional and global levels.

3.1 NATIONAL EXPERIENCES IN SATELLITE REGULATION AND POLICY

Three in-depth case studies were conducted for this Report, one each in Algeria, Nigeria and Tanzania, where satellite regulation and policies were examined in the context of key challenges that range from inadequate financial resources to insufficient experience in how to promote the emergence of a dynamic telecommunications sector.

Numerous other Administrations could have been selected for these case studies. Ghana, Morocco, Mozambique, Mauritius, Uganda... these countries and a host of others have begun the process of strategic liberalisation of the satellite sector. While limitations of time and resources prevented full analysis of every nation for this Report, a broad comparison of Administrations throughout Africa was nonetheless possible. This is reflected in Chapter 4 which, together with the focused case studies below, reveals that while new approaches to satellite regulation and policy are increasingly being applied, no two countries are the same.

From competition to convergence, and from privatisation to the establishment of separate rate regulators, the African landscape varies greatly. The pages that follow highlight both the highs and lows of that landscape.

3.1.1 NIGERIA CASE STUDY

Identification of the tools best suited to bridging the digital divide has become a major priority in Nigeria since 1998, when the Administration published its National Policy on Telecommunications. Formulation of the policy, which promotes liberalisation to encourage expanded access to telecommunications, aimed to redress the low rate of infrastructure development that occurred following the incorporation in 1985 of NITEL, the incumbent telecommunication operator.

The telecommunications policy goals established by the Nigerian Administration’s Vision 2010 Committee were ambitious:

* Increase teledensity from 1 telephone per 200 people to 1 per 50;
* Increase landlines to 4 million and mobile lines to 3 million;
* Attain global universal coverage and connectivity via a communications network that is part of the “information superhighway”;
* Implement institutional reform of the telecommunications sector and removal of existing monopolies to improve efficiency and quality and to make more services available;
* Enhance domestic capacity in telecommunication systems and service provision;

Table 4: Nigeria Key License Fees

<table>
<thead>
<tr>
<th>Nigeria</th>
<th>Fees</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyber-café license (Rural/Urban)</td>
<td>$38.50 / $192 / 1 year (N5k/25k)</td>
<td></td>
</tr>
<tr>
<td>A - Mobile Cellular Handset and HF/ VHF/UHF Radio</td>
<td>$1,923 / 5 years +2.5% of net turnover (N500k)</td>
<td>Includes PABX above 30 lines up to 100 lines</td>
</tr>
<tr>
<td>B - Satellite terminal equipment</td>
<td>$3,846 / 5 years +2.5% of net turnover (N500k)</td>
<td>Includes category A above plus: Installation of INMARSAT and other GM PCS Terminal Equipment</td>
</tr>
<tr>
<td>ISP License</td>
<td>$3,846 / 5 years +2.5% of net turnover (N500k)</td>
<td></td>
</tr>
<tr>
<td>Satellite network license</td>
<td>$65,000 / 10 years Domestic Only</td>
<td></td>
</tr>
<tr>
<td>C1 - Network and switching equipment</td>
<td>$7,692 / 5 years +2.5% of net turnover (N1000k)</td>
<td>Includes categories (A&amp;B) above plus: Installation of VSAT networks and switching equipment up to 600 lines</td>
</tr>
<tr>
<td>C2 - Network switching equipment</td>
<td>$15,384 / 5 years +2.5% of net turnover (N2000k)</td>
<td>Includes categories (A&amp;B, C1) above plus: Installation of VSAT networks and switching equipment above 600 lines</td>
</tr>
</tbody>
</table>

74 Speech by Engineer Johnson. http://www.ncc.gov.ng/Speech%20by%20Engr.%20Yo.%20Asinugo.htm
75 NCC, April 2004.
76 GVF Satellite Regulatory Survey.
77 Christopher Ajayi. 21st Century Technologies. Interview.
78 NCC, April 2004.
79 From a presentation given by Engr Olawale Ige, Commissioner, NCC, during Satcom Africa 2004 on 17 February in Johannesburg, South Africa.
80 Ibid.
81 Ibid.
82 Ibid.
83 Ibid.
To achieve these aims, Nigeria’s policy outlined institutional roles and responsibilities and called for the establishment of a transparent and accountable regulatory framework. The Administration regarded the NCC to be instrumental in achieving these objectives. Created by Decree 75 of 1992 as a response to insufficient development of the Nigerian telecommunications sector, the NCC’s objective has been to: Create a regulatory environment to facilitate the supply of telecommunications services and facilities; facilitate the entry of private entrepreneurs into the telecommunications market; and promote fair competition and efficient market conduct.

Analysts have seen the issuance of GSM licences in February 2001 as indicative of the NCC’s ability to create an accountable and transparent regulatory process. The bidding process and award of GSM licences was seen as competitive, fair and enabling. The NCC embarked upon a similar process of market liberalisation of the VSAT sector.

In the past, VSAT operators needed to obtain an Operator Licence from the NCC, then they were required to apply for a Frequency Licence from the Ministry of Communications and finally, authorisation to use spectrum or bandwidth had to be granted by the incumbent fixed-line operator, NITEL. To obtain a VSAT licence, the operator had to go through three agencies. This was time consuming and expensive.

Strategic sectors of the market were deregulated in 2000. One of these was the provision of domestic VSAT services. Others included sales and installation of terminal equipment; Internet services, and telecentres/cyber cafés. Since then, the number of government bodies that a license applicant has to go through has been reduced to one – the NCC. Licences have been consolidated into two major types:

* Permits: Services such as those provided by cyber cafés require a permit that costs 5,000 Naira (US$38) in rural areas and 25,000 Naira (US$189) in urban areas; they are valid for 12 months. All the cyber-café owners interviewed held permits.

* Basic Licences: These include both a licence fee and a percentage of annual net turnover (2.5%). Basic licences apply to ISPs, satellite network services (VSAT) and sales of satellite terminal equipment. An ISP licence costs 500,000 Naira (US$3,774) and is valid for five years. A satellite network service licence is valid for 10 years and costs 8.45 million Naira (US$63,783).

Licenses in Nigeria who have not commenced operations are required to make payment of 10% of the applicable licence fee as annual levy.

It is estimated that, of the 100 domestic VSAT licences awarded in Nigeria, 80% are held by entities whose networks were either never put into operation or have discontinued service. It is likely that the reason for such a large number of licence holders not implementing VSAT services has more to do with business inexperience than the Nigerian licensing process. The lower cost of hardware is enabling smaller enterprises to enter the business. These enterprises are more likely to have insufficient business experience and less funding to support an enduring telecommunication-service enterprise.

This finding has important implications for regulators considering how to proceed with liberalisation of the VSAT sector. When determining whether to limit the number of VSAT licences or to issue licenses to all applicants that satisfy the licensing-authorization conditions, the former option is often chosen on the basis that it will ensure that licenses are capable of providing high-quality services. The Nigerian Case Study demonstrates that permitting open competition can result, within the first 1-3 years of liberalisation, in licensed services being provided only by the most capable operators. (Similar examples have also been observed in other sectors. For example, when India fully liberalised its Internet sector, hundreds of ISP licenses were initially issued, but a comparatively small fraction of those licensees proved themselves able to provide the quality of service demanded by the market.)

Finally, the process of applying for VSAT licences in Nigeria, while it can take up to one year, is transparent. Part of the licence requirement relates to how the operator intends to source funds, and all successful licence holders reported that there were no hidden costs.

However, when the Nigeria Case Study was conducted, the NCC had temporarily suspended the issuance of VSAT licenses. The Administration stated that, while they have resumed issuing licenses, the temporary suspension was in order to evaluate the effectiveness of the licensing regime. During the period when no new VSAT licences were being issued, artificial price inflation of VSAT licences was experienced as operators bid for a limited number of licences or competed to form partnerships with existing licence holders.

The head of the NCC, Engineer Ndukwe is...
perceived, amongst larger telecom companies, to have transformed the NCC from an inefficient bureaucracy to an effective governmental organisation managed with private-sector-style efficiency. From the private sector’s point of view, the NCC is transparent and participative. Large telecom companies are asked to contribute to policy-making and inputs are acknowledged and often implemented. “He has brought dynamism and initiative to the NCC”, commented one member of the industry”.

Companies now believe that they have “government support” in doing business and believe that Nigeria’s telecommunications sector is a successful example of how to deregulate an industry. All of the larger telecom companies interviewed believed that the NCC’s credibility was enhanced through the GSM-licensing process.

Nevertheless, the dominant view is that policy makers need to further deregulate the industry. Specifically, Voice over Internet Protocol (VoIP) was observed as a key issue that needs to be addressed. VoIP is seen as an application that could reduce the cost of calls, both locally and internationally. Call charges (mobile and fixed line) were seen as exorbitant, and strong demand could reduce prices.

While the NCC was generally applauded for its role in reducing bureaucracy, government was still seen as not responsive enough to the rapidly evolving technology needs of the Nigerian telecommunications environment.

Amongst small-to-medium-enterprises (SMEs), the perception of the NCC was more mixed: Licence and permit fees were perceived to be too high and SMEs reported that they have difficulty obtaining licences for several reasons:

* High levels of bureaucracy. (For example, it is advantageous to have a lawyer act as a third party to ensure that all forms are correctly filled in);
* Getting a licence is time consuming. (Even though the licence forms are available online one still has to go to the NCC offices in Abuja to have them processed).

Amongst SMEs, unlike the larger operators, the NCC was seen as uncommunicative. The perception is that it does not understand SMEs’ needs and is only interested in high licence and permit fees. “We are trying to make the Internet accessible, but the NCC is interfering in the channels by which the medium is growing” said a representative from one company.

The suggestion made by SMEs is that NCC “interference” means that there is less opportunity for small companies. The NCC’s response to this position was as follows: “The problem with some of the SMEs is that they do not want any form of regulation at all and are resentful of any regulatory oversight. Many are involved in illegal refilling of traffic into the PSTN through VoIP and the use of telecom switches”.

While the Nigerian Administration has further regulatory challenges to address, a vibrant public- and private-sector dialogue is clearly present. This is one of a number of key contributing factors in Nigeria’s ongoing deregulation and liberalisation process. Begun in 2000, the regulatory reforms have transformed the Nigerian telecommunications market. The result has been a spectacular increase in investment in the industry; investors pumped US$4.0 billion into the sector by December 2003 compared with just $50 million at the end of 1999. The number of people provided with telecommunications services has increased; while connected lines grew at an average of 10,000 per annum in the four decades since independence in 1960, the past two years have seen more than 3.8 million lines (teledensity increased from 0.4 lines per 100 inhabitants in 1999 to 3.0 by December 2003). Bandwidth availability has increased and prices are on a steady decline; connection fees charged by operators decreased from $700 in 1999 to $50 in 2003.

Employment has also increased: Nearly 2,000 persons have been directly employed by new operators and an estimated 400,000 Nigerians are benefiting from indirect employment generated by the operators. (Indirect employment has also been created through contract awards to construction firms, research companies and media consultants, and significant numbers of Nigerians have returned from abroad to assist in building the communications sector). Both the corporate and individual consumer markets are benefiting from the increased range of options to connect them to the “information superhighway”.

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90 The Tanzanian Communications Regulatory Authority Act, 2003. pg. 9.
91 The Tanzanian Communications Regulatory Authority Act, 2003. pg. 9.
93 At the site visited in Mtwara, C-band was selected. The reason supplied was that there is severe rain attenuation during the wet season when Tanzania experiences torrential downpours.
94 This item is derived from a case study on Somaliland in the framework of the WDR project, February 2004, Knud Erik Skouby & Reza Tadayoni. Link: http://www.regulateonline.org/pdf/wdr0306.pdf

Figure 2: Strategic Liberalisation in Algeria Source: Balancing Act-Africa
**C-VS. KU-BAND SERVICES**

The use by VSAT service providers of spectrum in the 10-20 GHz range - often referred to as the “Ku-band” - for cyber cafés, home offices, ISPs, SMEs and corporate enterprises is perceived in Nigeria to be a new phenomenon. Approximately 90% of all interviewees held a negative perception towards Ku-band VSAT services, because of the view that it is unreliable during rainy weather. Estimates of the down-time experienced by users of Ku-band services ranged from one to almost four hours per day.

It is certainly true that higher frequencies are more prone to “rain attenuation”, which refers to signal degradation caused when atmospheric moisture (rain, storm clouds, etc.) passes between the satellite and the earth station. Indeed, this is why most VSATs installed in Africa have traditionally operated at the lower C-band frequency range (4-6 GHz). However, new techniques such as uplink power control – combined with higher power satellites and transmission systems - are now enabling the provision of highly reliable Ku-band services in regions of the world characterised by climates with high-density rainfall. This is significant for at least three reasons:

* Ku-band antennas are typically smaller – and therefore easier to transport and install - than C-band antennas;
* Ku-band systems are less expensive; and
* In many countries, Ku-band frequencies are allocated for exclusive or primary use by VSAT services. This facilitates the implementation of efficient blanket- and class-licensing regimes (see also Section 3.2.3), which is generally not true of C-band (4-6 GHz), which is typically shared by terrestrial and satellite services and must, therefore, be co-ordinated on a site-by-site basis.

As more companies begin to offer Ku-band services, further cost decreases will be realised. This process could be facilitated by improving access to technical literature about the distinction between Ku- and C-band and the advantages and disadvantages of each.

**TECHNICAL EXPERTISE**

In the survey conducted amongst Nigerian ISPs and cyber-café proprietors, all reported a lack of local technical skills. The time taken to install VSAT equipment ranged from two days to six weeks, with the average being around seven working days. ISPs that were subsidiaries of foreign companies were generally more successful when installing VSAT equipment. Those ISPs that relied on local technicians had a more extended installation time. For example:

* “The local engineers didn’t understand the installation diagram… and some equipment was damaged”.

All ISPs reported that local technicians “could not be trusted”. Of all the interviews conducted, only one company actively trained local technicians. From this company’s viewpoint, locally trained technicians were cheaper, understood local conditions and could respond faster and more effectively than foreign technicians. However, resources had been dedicated to training local technicians, something that did not seem to be taking place in most other companies.

The lack of local technical skills is further exacerbated when VSAT equipment and bandwidth is sold in neighboring countries. Installation is often performed on tight budgets and with insufficient training of local technicians. The result is that when maintenance or repairs are needed, the cost can be too high for the VSAT supplier to countenance. Therefore, one recommendation is to focus on the provision of technical skills in order to overcome this negative perception and the development of local expertise in installing and maintaining VSAT technology.

As the Nigeria Survey was being conducted, satellite industry quality-of-service standards had begun to be strengthened in Nigeria - and more broadly throughout Africa - with the provision of the first GVF VSAT Installer Training Course. The training programme is part of a global campaign launched recently by the international satellite sector to tackle the issue of communication signals interference - a technical problem that often impedes service quality and costs the industry millions of dollars each year in added operational expenses.

The GVF is currently developing plans to deliver the course in co-ordination with other organisations in Africa.

**3.1.2 ALGERIA CASE STUDY**

The Algerian Administration expects to begin liberalising its telecommunication sector this year (2004), and strategic importance has been assigned to the role of satellite communications in the country. The Minister of Posts, Information and Communications Technologies, Amadou Tou, has cited insufficient transmission capacity as a key motivation and acknowledged that, although the Administration had been late in developing its plans, liberalisation was considered vital to the growth of fixed and mobile telephony in the country.

The liberalisation plan, which arises from the National ICT Policy Formulation Committee, aims to position Algeria as an ICT hub in North Africa and to extend connectivity to all Algerians. The Ministry plans to follow a
phased liberalisation process, beginning with the GSM sector and followed by VSAT, GMPCS, rural and international telephony, and fixed-line networks.

Satellite services’ cost insensitivity to distance was the most important factor in the Administration’s decision to liberalise VSAT immediately following GSM. The southern parts of Algeria are dry with few inhabitants so, in many cases, it would not be economically viable to provide services other than those based on VSAT systems. The northern parts of the country, while more densely populated, are mountainous and fixed-wireless and fibre-optic networks would be difficult to install and maintain in some areas. VSAT, in the opinion of both the Ministry and the regulator, Autorité de la Poste et des Télécommunications (ARPT) is thus a primary means of providing access to communications in both regions.

ARPT was formed in May 2000 to manage the liberalisation and deregulation process and to ensure that government policy decisions are enforced. It reports to Parliament annually. It is funded through operators’ contributions and does not receive any government funding. ARPT does not report to other organisations and is not legally obliged to consult or inform any other organisation prior to making decisions. ARPT is the regulator for both the Algerian Post Office and the telecoms sector.

As a relatively young organisation, ARPT has a shortage of skilled staff, many of whom came from the incumbent, Algeria Telecom (AT). This has created a tendency for ARPT to rely on data supplied by AT in making rulings. A recent example of this was the local call-price increase in June 2003. Local calls were increased by 355% based on AT’s argument that the existing tariff structure was not covering its costs. The impact on Internet users, the industry and the economy generally has been deleterious and is still evident.

In addition, a stable regulatory environment has been lacking with, for example, VSAT licences being issued, then withdrawn, then re-issued both to VSAT users and suppliers. This pattern is indicative of a lack of regulatory experience, as is the imposition of a “sky tax” of $5,000 per month per ISP for the use of satellite bandwidth. While this tax was subsequently withdrawn, the fact that it was implemented shows a lack of consultation with the private sector and yet a desire to correct the error once its implications became clear.

Other challenges are yet to be faced. The planned VSAT-operator licences are to be awarded to the highest bidders. The Ministry is budgeting for approximately US$2 million for the two licences that are to be issued. The intent of the proposed licensing regime is to require local VSAT networks to rely upon local hubs. The Ministry, based on a report commissioned in 2000, argues that VSAT networks with hubs located outside of Algeria would limit the number of VSAT terminals within the country, and the demand for VSAT is so great estimated by the Ministry to be more than 10,000 earth stations - that the creation of a local hub is the only way of cost-effectively satisfying local demand. However, with the presence of European satellite footprints in Algeria, the greater economies of scale achievable by operators there could make competitive provisioning of basic Internet services from within Algerian hubs a difficult task.

Nevertheless, once the VSAT-operator licences have been granted, users will be encouraged by ARPT to purchase bandwidth from the licence holders. ARPT argues that users will migrate to either of the two licence holders because the pricing will be better than any other operator (specifically, those using international satellite service providers). ARPT will enforce this by monitoring bandwidth prices. ISPs that resell bandwidth provided by international satellite providers will be allowed to continue to operate under their ISP licences. The Ministry believes that licensing VSAT in this manner will:

* Generate revenue (note that ARPT is not funded by government); and
* Increase Internet connectivity in Algeria.

Incumbent ISPs are concerned about the anticipated changes to the regulatory regime. Currently, the selling of bandwidth requires an ISP licence, which is not difficult to obtain. A user may purchase bandwidth from any company. There is no distinction between local and foreign service providers.

However, once the VSAT operator licences are issued, preference will be given to one of the two licensed operators.

In effect, ARPT is on a steep learning curve. Greater consultation internationally and internally, plus development of human capital will be vital to its success. The Administration repeated that it is committed to a rapid liberalisation process, but human-resource and other issues are expected by the local ICT community to pose challenges in meeting the 2004 target.

### CURRENT REGULATORY APPROACHES

**Direct to Home (DTH) networks used for broadcasting are widespread in Algeria. There are no licence or registration (authorisation) requirements for DTH systems or receive-only VSAT systems. Two-way VSAT systems require authorisation, because the military was concerned that the systems could be used for “terrorist” purposes, particularly in the south of Algeria. The result is that many cyber cafés use receive-only VSAT for the downlink and dial-up for the backhaul.**

There are currently two licence categories:

* Private network; and
* Public network.

ARPT has not issued any public-network licences. To understand why – and to appreciate the distinction between public and private licences - one must also understand ARPT’s definition of a VSAT network, which requires a public licence if it fulfils two conditions: First, if the hub is located in Algeria; and second, if bandwidth is being resold using the local hub. According to this definition, there are currently two VSAT operators: AT and Tele Diffusion of Algeria (TDA). AT is the incumbent and, while it operates a VSAT network, it does not need to have been granted a VSAT licence. TDA is primarily a broadcaster, though it also sells bandwidth to ISPs (basically, it is a carrier of carriers).

Since both are government owned and the existing legislation is under review, ARPT has decided not to issue VSAT-operator licences to these two organisations. Instead, when the new licensing requirements are announced in 2004, TDA will have to apply for one of the two VSAT-operator licences being offered. It is assumed that the two operator licences being considered are in addition to AT.

Currently in terms of private-network licences, any company may use VSAT. ARPT does
not view any ISP selling bandwidth via VSAT and connecting to the PSTN as having a public network. If a company sells VSAT equipment, authorisation must first be acquired. There are currently no licence fees and there is no licence fee for importing VSAT equipment, simply an administrative fee of about US$43 and an annual usage fee of US$286.

The authorisation simply consists of registration with ARPT and any company using VSAT equipment is required to obtain an authorisation from ARPT. Authorisation forms are easy to obtain and copies may be made. Once the forms have been completed they must be submitted to ARPT. Online or faxed forms are not accepted. The existing authorisation requirements are:

* Letter of request;  
* Technical details of equipment;  
* Copy of company’s status and/or contract between demanding organisation and AT;  
* Company registration form; and  
* Payment of 3,000 Dinar (US$43) per VSAT station.

The authorisation process is as follows:

* Submit authorisation documents to ARPT;  
* The documents are delivered to the Ministry of Posts, Information and Technology;  
* The Ministry delivers the documents to the Army for clearance;  
* The Army returns the documents to the Ministry;  
* The documents are returned to ARPT.

In all the interviews conducted, amongst both ISPs and users, the approximate time period required to receive a VSAT authorisation was three months. ISPs and users argued that this was the major obstacle to the broader roll-out of VSAT services.

Companies have become frustrated with the lengthy time period and are looking to alternative methods of providing connectivity. The time period involved and perception of arbitrariness in granting authorisations have led to allegations of corruption against ARPT and the government.

The view amongst ISPs is that those individuals who are critical of government are unlikely to receive authorisation.

**UNIVERSAL SERVICE OBLIGATIONS:** Both the GSM and the incumbent operator have universal service obligations. The Universal Service Fund (USF) was set up at the beginning of 2003. Operators are required to contribute 3% of turnover per year. The fund pays monies to those operators that extend their services to rural areas. While a Steering Committee has been established to move the national agenda forward, it has yet to develop an implementation strategy. There is no telecommunication regulatory institution in Somaliland. There is consensus among operators that it would be desirable, but Somaliland is at the beginning of the institutional creation process.

The competition in the telecommunication market is “a negotiated competition”. All operators cooperate in the Somaliland Telecommunication Operators Association, where they agree on prices and give information on this to the Ministry. Prices are uniform and adjusted according to inflation and the exchange rate to the US-dollar.

Fierce competition has driven consumer costs down; international calls on mobile phones cost US$1 per minute or less, five or six times lower than in most African countries. The low prices for international calls may be seen as a combined result of real “competition”; low economic level/development and no public intervention.

Satellite technology is playing an instrumental role in Somaliland. Based on 2002 prices, it has been shown that a VSAT-based asymmetrical 128/64 connection in any given location in Somaliland costs $0.058 per minute, assuming the connection is used 24 hours per day, seven days per week. Further, the connection may be shared by several PCs and the “per minute charge” can then be lowered accordingly. A tele-centre scenario in Somaliland showed the rate per PC to be 0.005 per minute.

**Somaliland: Competition, VSATs & Connectivity**

Somaliland, one of the poorest countries in Africa, provides a useful example of the extent to which a liberal VSAT market – indeed, one that currently is driven largely by the private sector – has facilitated improved access to low-cost telecommunication services.

Somaliland, which declared its independence from Somalia in 1991, enjoys a relatively well-functioning civil society and peace. ICT usage is still very low, but with clear development potentials associated especially with the presence of telecommunication companies from neighboring countries, expatriates engaged in the universities and other sectors, and the presence of five telecom operators and several VSAT operators.

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is meant to provide mechanisms to decrease the divide between urban and rural ICT access, but has yet to be implemented. Lack of electricity in rural areas has been an ongoing problem, however, and operators have suspended payments to the Fund until it becomes operational. It is understood that a study on the issue of the implementation of the RTDF will be completed this year.

REGULATORY FRAMEWORK
The Tanzanian Communications Regulatory Authority Act of 2003 combined the Tanzanian Communications Commission and the Tanzanian Broadcasting Commission into one body - the TCRA. It is expected that the Board of Directors will be appointed this year. While the telecommunications and broadcasting agencies have been assimilated, the corresponding functions within government continue to exist. The TCRA reports to two Administration officials, the Minister of Communications and the Minister for Broadcasting. The Act divides the functions of the TCRA into three broad categories: Licensing, monitoring, and dispute resolution. TCRA’s raison d’être is licensing. This is not purely an independent function; any licence relating to universal access or with a time period of more than five years must be approved by the Minister of Communications or the relevant sector minister.

The Act further states that the regulator is responsible for monitoring:

1. Levels of investment;
2. Availability, quality and standards of services;
3. Cost of services;
4. Efficiency of production and distribution of services; and
5. Other matters relevant to the Authority.

TCRA is also expected to develop the capacity to monitor the size and growth of the ICT sector in Tanzania.

Since the regulatory authority is in transition, no new decisions have been made. Among decisions that are currently awaiting the newly constituted Board are:

- Legal action against the TTCL for failing to meet its infrastructure roll-out targets (the fine is currently US$46 million and a schedule of payment was expected to be subMITTED BY THE TTCL TO TCRA IN THE FIRST QUARTER OF 2004);
- Granting of new licences such as Public Data Operator licences;
- Implementation strategy for the RTDF; and
- Reduction of the royalty fee paid by Public Data Operators from 3% to 1.5% as stipulated in the Act.

LICENSING
There are currently five basic categories of telecommunications operators of which three are relevant to this report:

- Public data communication operators;
- Private data communication operators; and
- Internet service providers.

Table 7: License Fee Cost Comparison for Nigeria, Algeria and Tanzania

<table>
<thead>
<tr>
<th>Country</th>
<th>License</th>
<th>Fee</th>
<th>Cost/ Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>ISP License</td>
<td>$3,846.00</td>
<td>$3,846.00</td>
</tr>
<tr>
<td></td>
<td>Satellite Network License</td>
<td>$65,000.00</td>
<td>$65,000.00</td>
</tr>
<tr>
<td></td>
<td>Network Switching Equipment</td>
<td>$7,692.00</td>
<td>$7,692.00</td>
</tr>
<tr>
<td></td>
<td>2.5% Turnover</td>
<td>(0.025x240000)x5</td>
<td>$30,000.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$106,538.00</strong></td>
<td></td>
</tr>
<tr>
<td>Algeria</td>
<td>VSAT Admin Fee</td>
<td>$43.00</td>
<td>$4,300.00</td>
</tr>
<tr>
<td></td>
<td>Annual user fee</td>
<td>$286.00</td>
<td>$28,600.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$32,900.00</strong></td>
<td></td>
</tr>
<tr>
<td>Tanzania</td>
<td>Public data network</td>
<td>100,000.00</td>
<td>$100,000.00</td>
</tr>
<tr>
<td></td>
<td>3% Turnover</td>
<td>0.03x240000)x5</td>
<td>$36,000.00</td>
</tr>
<tr>
<td></td>
<td>ISP License</td>
<td>$1,000.00</td>
<td>$26,000.00</td>
</tr>
<tr>
<td></td>
<td>VSAT licenses</td>
<td>$1,000.00</td>
<td>$100,000.00</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>$262,000.00</strong></td>
<td></td>
</tr>
</tbody>
</table>

There is full competition in each of these categories. The barriers to entry are primarily financial (namely, start-up capital and licence fees) rather than regulatory. The licence fees for the categories relevant to VSAT and the existing number of operators are shown in the Table 6.

A VSAT station is defined by the TCRA as any satellite system that is capable of receiving and transmitting data or, in other words, that has a transceiver.

IMPLEMENTING “LIGHT TOUCH” REGULATION
A recurring theme in the Tanzanian ICT sector is the lack of government involvement. In certain areas, a lack of government coordination has facilitated competition, such as the ISP sector, but other areas - such as public data operators – have not been viewed by the private sector as successful. One of the unstated themes of Tanzanian ICT policy is that a competitive market will promote more efficient services and reduce the burden on government. This has meant that the data communication sector has been opened to any organization that can afford the licence fees.

The belief in competition has informed the approach of the TCRA to the ICT sector. The regulatory body does not play any role in the active creation of “a conducive framework for investments in capacity building” . Rather, the TCRA is required to monitor the levels of investment in the sector, the availability, quality and standards of service, the cost of services and the efficiency of production and distribution of services. Several developments in these areas are addressed below.

LEVELS OF INVESTMENT
Several interviews were conducted with public and private data operators. The majority of these companies use VSAT as the only available alternative to fixed-line technology. The oft-repeated complaint about TTCL is that the leased-line service is too expensive, service levels are poor and the waiting period for connection is too long. Thus, VSAT-based services have a large role to play within the Tanzanian ICT economy.

Of the 10 public data operators, only seven are operational. Of those, only one (Satcom Networks Africa) has built a local hub at a cost of approximately US$2.5 million. This is despite the fact that operators are obliged to build local hubs as part of their licence conditions. The other public data operators interviewed stated that they were not willing to build a local hub, because the investment environment is too risky. The perceived risk relates to the fact that there is no limit to the number of data operators that can be licensed. Thus, there is a perceived danger that the market could become over-traded (something that existing data operators argue is already the case). Adding to the uncertain environment, the royalty fees (3% of revenues) helps to encourage operators to maintain a high-margin business with low sales growth focused on the corporate market. Various multinational companies and NGOs have agreements with suppliers in their countries of origin, bypassing local operators.
EFFICIENCY OF PRODUCTION AND DISTRIBUTION OF SERVICES

One of the stated aims of the Tanzanian National ICT Policy is to strengthen availability of ICTs. There are several efforts to achieve this:

The Tanzanian Posts Corporation is in the process of setting up a VSAT network to connect 14 of its postal branches to an internal network that will allow faxing and the transfer of monies between branches (there is a building savings component to the post office). In addition, post offices will offer cyber-café facilities at selected branches. The cyber cafés are not designed to be profitable, but they are perceived by the post office as a potential source of revenues (the network was funded by international donor agencies).

International donor agencies such as the Swedish national development agency, SIDA, are investigating setting up a VSAT network for distance education, linking teachers together so that information can be exchanged on educational methods and tools. This VSAT network will be one of the largest in the country (approximately 34 stations). It is seen as a test case for the provision of affordable connectivity.

The Department of Management Information Systems at the President’s Office is investigating an upgrade of existing government VSAT networks to connect local government branches and migrate applications such as payroll and other human-resources functions onto the network. The Ministry of Defense currently owns an analogue VSAT network on which only 10% of the capacity is utilised. The project is investigating whether this network can be digitalised and more effectively utilised by government departments.

Rural solutions are also a high priority. In terms of a sustainable private-sector model for VSAT implementation, one candidate is an initiative supported by Simbanet, a local public-data operator. The model assumes that multiple sources of revenues have to be found in order for rural projects to be sustainable (and therefore profitable). In addition the lack of electricity grid in rural areas is another barrier to overcome. There are several steps to Simbanet’s model:

* Partner with local businesses;
* Sell value-added services to local businesses in the surrounding area (in other words, to become the local ISP); and
* Create a 50% partnership between Simbanet and the local business entrepreneur, which would share the start-up costs.

By partnering with the local business, Simbanet intends to place the local business under its public data-operator licence and thereby avoid the need for the local business to be registered with TCR A and to pay licence fees. Simbanet would pay the annual VSAT spectrum fee as part of its contribution to the cost of the new business and eliminate the necessity for involvement in licensing by entrepreneurs who use the network.

The equipment would be leased by Simbanet to the entrepreneur. If one includes depreciation costs, 70-75 small businesses must be signed up to the local ISP for it to remain in business. The cyber café installed at the ISP offices is seen as a side business, which would generate revenue, but one that does not have much growth given current income levels in the area. While the one site visited is not a representative sample, similar models are worth investigating as a sustainable method of introducing connectivity to rural areas.

3.1.4 IMPLICATIONS OF THREE-COUNTRY ANALYSIS

The studies found that the three countries are on different points of the ICT-development curve and that the varying levels of progress – particularly with regard to access to satellite-based telecommunication services – are largely attributable to the effectiveness of each country’s policies and regulations.

In trying to compare the license fee burden on VSAT networks in the three countries a hypothetical 100-terminal network was costed according to each country’s license fee structure, assuming an arbitrary monthly revenue or turnover of $200 per terminal over five years. Table 7 shows that Tanzania’s license fees place almost 2.5 times as much burden on the network than does Nigeria. In Tanzania the fees over the five-year license period amount to over $260,000, or about 22% of the five-year operating cost vs. $106,000, or about 9% in Nigeria. Algeria’s cost is considerably lower, at about $33,000, but this is likely to increase when licensed VSAT operators are introduced.

In a ranking of telecommunications development in the three countries surveyed, Nigeria would be at the top of the curve, followed by Tanzania and Algeria. Nigeria’s success is largely attributable to how much further it has progressed in liberalising and deregulating its market. But the underlying explanation for Nigeria’s progress is the effectiveness of the regulator.

Algeria has begun restructuring its telecommunications sector, but the new conditions to be applied to the VSAT sector are as yet unknown; if they become more restrictive they are likely to result in service cost increases. In Algeria, users are concerned about the regulator’s past vacillations regarding VSAT licensing approaches and see the recent imposition of a satellite “sky tax” (a move that has since been rescinded) as indicative of a lack of understanding of how to facilitate service provision.

Growth of the Algerian ICT market in general has been stalled by an inconsistent regula-
lic data operators) to focus on high-margin returns. But the perception that there will be low activity fees. Operators do not perceive Tanzania to have an environment that will provide them with a return on their investment and this also explains their reluctance to invest in a local hub. Added to licensing fees are customs duties, which are often so high as to prevent cost-effective access to VSAT equipment. The case studies also revealed that access to satellite-based services is generally being hindered by lack of knowledge. Broadly, the information requirements suggested by each of the country case studies can be summarised as follows:

* Algeria: Support is needed relating to technical considerations (e.g. local VSAT hubs), economic factors (e.g. satellite bandwidth costs), and effective regulatory approaches (case studies of countries that have liberalised the VSAT sector);
* Nigeria: Dissemination of VSAT technical literature and marketing of Ku-band VSAT services are needed to promote the technology’s ability to serve as a cost-effective alternative to C-band systems for some applications; and
* Tanzania: Dialogue amongst the regulator, ministries and other government offices needs to be strengthened with the aim of developing the local ICT sector.

The three case studies also highlight different sets of challenges, each of which are reflected by the Cyber-cafe Consumer Survey (see above). Usage is increasing dramatically in Nigeria with consumers requiring more bandwidth-intensive applications. Of the ICT consumers surveyed in Lagos, 47.1% said they had increased their usage of cyber cafes, compared to 40.5% in Algiers and 32.7% in Tanzania. In Algeria, usage is increasing steadily but consumers are beginning to turn towards applications that require less bandwidth. A significant portion of consumers in Algiers - 31.1% compared with 16.5% and 12.5% in Lagos and Tanzania, respectively - reported that their usage had decreased over the last six months. In Tanzania, a common complaint is the high price of bandwidth; 54.9% of consumers reported that their usage patterns had remained the same. The conclusion to be drawn is that the consumer and user market is stagnating without investment in local infrastructure as market entry cost remains high and the economies of scale are not achieved.

Nevertheless, the consumer surveys undertaken in all three capital cities are striking because of the similarities in usage trends and, although the findings are limited, they indicate a similarity in demand that is driven by the need for affordable, fast connectivity. Accordingly, the case studies above demonstrate that VSATs are seen by all three Administrations as strategically vital in enabling them to achieve public-policy objectives and each is moving to facilitate their use through liberalisation and improved regulatory approaches.

Finally, these three Administrations stand in stark contrast to African countries where duopolies and monopolies are still in place. As was revealed by the IDRC Pan-Africa Satellite Survey and as is shown in Section 4.2 of this Report - when an Administration is focused on protecting state investments in a monopoly or duopoly, the inherent potential of market forces to more rapidly increase access and decrease cost of service is greatly inhibited... or prevented outright.

This point is underscored further by the accompanying case study on Somaliland and by the regulatory experiences identified in the following sections.
Challenges & Solutions:
Satellite Regulatory Guidelines for Africa
This section draws upon successful satellite regulatory and policy practises currently being applied in Africa and, indeed, throughout the world. As such, it aims to provide African Administrations with practical information that constructively informs their decisions relating to the formulation of effective satellite communications regulations and policies.

4.1 OPTIMISING THE REGULATORY FRAMEWORK

African Administrations are, like their counterparts in other regions, discovering that it is beneficial to establish a legislative and regulatory environment in order to promote competition and attract private investment. Without an appropriate legal framework for sustained telecom infrastructure development, other efforts aimed at bridging the “Digital Divide” may have little long-term impact.

The introduction of competition and privatisation has made most governments fully aware of the importance of effective, well-financed, and professionally-staffed regulatory authorities. These regulatory bodies have been mandated to implement competition to ensure that services are:

* Extended to more people;
* Made more affordable;
* Provided at high levels of service quality; and
* Relevant to, and understood by, a broad range of society.

The ITU’s Regulatory Database reflects that, as of this year, there were 124 separate regulatory authorities worldwide. Of these, African regulators represent 27% of the total – second only to Europe as the largest regional number. African Administrations’ trend toward establishing separate regulatory agencies was echoed by the IDRC Pan-Africa Satellite Survey, which asked Administrations whether there was an “independent regulator” established in their country. Of 24 responses to the question, seven replied that there was no independent regulator and 17 answered in the affirmative.

What was even more telling was that of the 17 who said there was an independent regulator in their country, 12 added comments relating to the fact that, while there was a regulator, its “independence” had yet to be affirmed. (This type of comment was also a recurring feature of open-forum discussions held last year with regulators during GVF VSAT workshops in West, East and Southern Africa.)

IDRC Pan-Africa Satellite Survey respondents from Administrations where a regulator has been established most often noted that achieving true “independence” was a lengthy process, particularly as regards its relationship with the local ministry of communications and, in some cases, the military.

Angola’s experience provides a relevant example:

Although Angola’s Telecommunications Act provides for licensing of private VSAT networks, and stipulates that the regulator, INACOM, is competent to issue licences for such networks, INACOM’s general power to issue licences is in competition with an identical power held by the Minister. Further, INACOM’s power to issue licences is circumscribed by the regulatory authority’s obligation to deal with licensing in such manner as the Minister may order. In practice, INACOM never issues licences without either formal or tacit Ministerial approval. Power belongs to the Minister in any event, as – should there be differing views on the interpretation of the law on this point – the Minister has been granted, by decree, the power to interpret the law. The framework in South Africa is very similar, with the Minister approving all new regulations and licenses.

95 See http://www.itu.int, ITU-D Question 17-1: “Satellite regulation in developing countries”.
96 DeTeCon International.
97 See http://www.itu.int, ITU-D Question 17-1: “Satellite regulation in developing countries”.
98 IDRC Pan-Africa Satellite Survey.
99 Ibid.
100 InfoDev: Telecommunications Regulation Handbook, Module 1, pg. 1-6.
On the other hand, in some instances, whilst regulatory authorities have become entities separate from the incumbent national operator, those entities with independent regulatory functions sometimes combine their activities with policy-making, which may also include supervision of state shareholdings in the incumbent operator. What is clearly of importance is that where the policy maker and regulator are distinct entities, good co-operation between policy maker and regulator is of the essence and independence is best guaranteed if responsibility for the state shareholding in telecom companies rests with an entity other than the telecoms regulator.

These aren’t the only challenges for new regulators or, indeed, for those who rely upon them. As African governments move to establish independent regulatory authorities, it has been observed that licensing, at least in the medium term, becomes more difficult. There are then two entities to which to provide information, and two entities that must grant their approval. Indeed, disagreement between the two (as happened recently in Gabon) can lead to one seeking recourse against the actions of the other, thereby blocking the entire licensing process (incumbent operators are also inclined to use this struggle for control in an effort to delay liberalisation of their services).

Has always been the case that most applications for VSAT licences have been accorded the same levels of scrutiny and importance as licences for networks serving the public or the nation at large (even to the point of requiring cabinet-level or presidential approvals). The simple fact of having a ministry with real authority and a regulator with nascent and contested authority has complicated some markets immeasurably. But again, this is more of a West African than an East African phenomenon.

Nonetheless, the overwhelming trend toward the establishment of telecommunications regulatory authorities (TRAs) gives credence to the assertion that the standard institutional structure for the telecommunications sector around the world today includes a separate and autonomous regulator.

However, it should be noted that while TRAs may influence policy formulation, typically TRAs are only able to implement government-approved policies. Thus, the government has primary responsibility for developing policies that promote expanded access to telecommunications through increased competition and improved regulations.

**ADMINISTRATION CHECKLIST: THE INDEPENDENT REGULATOR**

Positive reasons for independence and separation of TRA activities include:

1. The perceived neutrality and insulation of TRAs from political or operational pressures;
2. Operators and investors will generally have greater confidence that an independent TRA will regulate a market objectively and transparently; and
3. This leads to increased investment in the

4. **CHALLENGES AND SOLUTIONS: SATELLITE REGULATORY GUIDELINES FOR AFRICA**

   **4.2 STRATEGIC LIBERALISATION IN THE VSAT SECTOR**

   African Administrations, more than many of their counterparts in developing countries of other world regions, have begun to implement strategic liberalisation of VSAT services (see Table 8). As noted in the introduction, as recently as 1997, virtually none of the African Administrations had introduced competition into their satellite communications sectors. Since then, most have now implemented some form of liberalisation, a fact supported by the IDRC Pan-Africa Satellite Survey: Of 17 responses, 10 replied that competition was permitted and others noted that plans were being made to introduce further satellite-based competition.

   The value of strategic liberalisation has long since captured the attention of the international telecommunications sector. Four years ago, a key conclusion of the ITU’s “Asia-Pacific Telecommunications Indicators” concluded simply that “Market opening works: try it.” It was in this context that the importance of strategic liberalisation – the selective opening of a market, sector by sector, to help an Administration achieve targeted policy objectives – was underscored. According to the ITU Indicators, ultimately, even in countries that choose to retain a voice monopoly for the fixed-line incumbent, competition can be permitted in other market sectors creating opportunities for those networks or services through competition and private-sector participation.

The African trend toward strategic liberalisation of VSAT was underscored by the latest regulatory developments in Algeria, Nigeria and Tanzania (see the case studies above). In each case, the Administrations had identified VSAT-based services as one of several key telecommunications tools to be liberalised and for which regulations would be optimised.

Another of the sectors that tend to be targeted for strategic liberalisation by African Administrations is Internet services. However, the extent to which the ISP sector has been fully liberalised is significantly greater than for VSAT-based services, suggesting considerable opportunities for further progress in African liberalisation (see Chart 7).

Why have some African Administrations not yet liberalised the satellite sector? There are at least three reasons, according to Perminus Karungu, who serves as Senior Officer, Licensing and Compliances, for the Communications Commission of Kenya.

Mr. Karungu outlined three key reasons as follows:

1. **Desire to protect the incumbent operator(s):** At the onset of liberalisation, many countries… took deliberate policy decision[s] to offer protection to the incumbents for a period of time with the hope that the incumbents could use the opportunity to consolidate themselves in

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1. **Mr. Karungu’s views were provided during a presentation given at Satcom Africa 2004 on 17 February in Johannesburg, South Africa.**
2. **It is noteworthy that access to telecommunications has recently begun to be provided in Kenya’s rural areas through a network provided by CommCarrier, a Kenya-based company, to the Kenya Tea Development Agency. The VSAT-based solution has not only served as an enterprise network for the agency, but also as a means for remote communities to obtain access to communications. A case study on the success of the network was provided in 26 September 2003 during a VSAT Regulatory Workshop provided jointly by GVF and the Commonwealth Telecommunications Organisation in Mombasa for the East Africa Regulators Posts and Telecommunications Organisation (EARPTO).**

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**Chart 7: ISP & VSAT Liberalisation in Africa. Source: ITU 2002.**
2. Fear of the unknown - Myths regarding satellite communications: “Due to a lack of comprehension by policy-makers particularly regarding satellite communication trends and their impact, most of them opted to stay out of these technologically advancement[s] for fear that their markets will be dominated by ‘outsiders’. This situation has led to incoherent and unstable policies and regulatory regimes.”

3. Lack of appreciation of the additional benefits of deregulation: “Most policy-makers don’t spend time to study the additional significant benefits brought about through deregulation. These range from improved investment to job creation, like in the case of call-centres.”

Indeed, as this Report was being drafted, increased pressure was being applied by the Kenyan Internet sector for the Administration not to implement “restricted licensing” of VSATs. In an open letter to the Kenyan government, TESPOK, an association representing local Internet interests, drew public attention to the Administration’s intention to begin issuing a limited number of licenses on a competitive-tendering basis for two “protected segments”: International Internet/data gateways, and VSAT hubs.

Among the arguments made by TESPOK for full liberalisation of Kenya’s VSAT sector are the following:

- **Cost:** Competitive tendering inevitably leads to high prices, which are passed on to the consumer in the form of higher prices. This is not just a cost to the consumer, but also a cost to the economy. TESPOK has calculated that the direct cost to Kenya’s economy over the next five years, if this policy is implemented, will be in excess of KSh 16 billion (US$220 million). (See also the case studies in Section 3.1.)

- **Precedent:** In Tanzania, anyone can apply to install a VSAT and be granted a license after paying a fee of US$5,000 per annum. The same applies in Uganda except that the fee there is only US$4,000 per annum. In its open letter, TESPOK asked: “Why does the government claim with one hand that they wish to stimulate economic recovery and with the other introduce policies that will make Kenya regionally uncompetitive?”

- **Technical:** It is wrong to have a “middle man between the Kenyan ISP and the rest of the world.” Tespok argues that Internet exchange points are the building blocks of the global Internet. There are many exchanges in the world, but ISPs’ analysis of Kenyan traffic patterns confirms that the most important ones for Kenya are the Internet exchanges in London and New York. Asks TESPOK: “Why should a Kenyan ISP be forced by regulation to use a third party intermediary – these so-called ‘Internet Backbone Licences’ – between their Kenyan ISP network and these Exchanges around the world? It goes without saying that the route is longer and the costs will be higher.”

TESPOK concludes by requesting the government to reconsider its plan and permit any qualified operator or service provider who applies for a license to operate satellite services to, upon payment of the relevant fee, be granted a license (103). Malawi’s experience reinforces the ITU’s conclusion that “market opening works.” Separated from the Post Office in 1997, Malawi Telecommunications Limited (MTL) is the sole operator of the fixed line telecommunication services, but does not have a legislated monopoly. The terminal equipment market is now fully liberalised and ISPs are allowed to use VSATs to obtain international bandwidth independently of MTL and to use wireless data links to service customers. Multi-banch companies such as Lever Brothers, Shoprite, and Olilkom have also begun to use VSAT to service their internal data communications needs, including online connections directly to South Africa.

In Malawi, a VSAT license costs US$5,000 on site initially and $2,500 per year subsequently. About 20 licenses have been issued. According to the Malawi Communications Regulatory Authority (MACRA), the uniform licensing regime may in future be reviewed with “a downward adjustment [of fees] likely to take into account the emergence of low-cost Ku-band two-way VSAT-based Internet services aimed at small businesses and residential users.”

By contrast, South Africa is with regard to its VSAT sector - one of the least liberalised nations in sub-Saharan Africa. At the moment Telkom SA (through a PSTS licence) and Sentech (a state-owned member of South Africa’s satellite duopoly through a Multimedia Service licence) are the only providers allowed to provide VSAT services within South Africa. The incumbent, Telkom SA, holds a monopoly for international VSAT services (104). An international telecommunication service licence and multimedia service licence can only be issued upon an invitation from the Minister. Further, agreements need to be made with licensed operators to obtain VSAT network facilities and services. Two private network operators serving Closed User Groups are active in the South African market, the power utility company Eskom and the railway company Transnet who will shortly be jointly issued with the Second Network Operators (SNO) license and are expected to leverage these resources to compete with Telkom SA.

The South African government’s regulatory

### Table 8: Competition in African VSAT License Regimes

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<thead>
<tr>
<th>Source: ITU Trends in Telecommunication Reform 2003, IDRC and GVF Satellite Regulatory Surveys</th>
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<tr>
<td><strong>Group 1: Full Competition</strong></td>
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<td>Botswana</td>
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<td>Burkin Faso</td>
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<td><strong>Group 2: Partial Competition</strong></td>
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<td><strong>Group 3: Duopoly</strong></td>
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<td><strong>Group 4: Monopoly</strong></td>
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<td>Ethiopia</td>
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<td><strong>Group 5: Not Available</strong></td>
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<td>Central African Republic</td>
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<td>Congo-Leopoldville (D. Rep.)</td>
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<td>Djibouti</td>
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<td>Equatorial Guinea</td>
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103 TESPOK called upon the general public to demonstrate support for a fully liberalised market by sending an email to ISPsNeedVSAT@LiberalizeVSAT.Co.Ke or visiting www.LiberalizeVSAT.Co.Ke

104 Derived from a presentation given by a representative of Malawi’s regulatory agency, MACRA, during an ITU Roundtable on Least Developed Countries held in Arusha, Tanzania, on 3-4 April 2003.

105 DeTeCon International.

106 In comments made during a presentation at Satcom Africa 2004, Johannesburg, Manda Langa, Chairperson of ICASA, stated: “The Authority is aware that most jurisdictions have liberalised, or are in the course of liberalising VSATs. In so doing these jurisdictions determine technical specifications that must be complied with, but the trend seems to be towards the exception of VSATs from licensing. We hope that the VSAT issue can be addressed in the context of the Convergence Bill.”
approach has increasingly attracted criticism, particularly from neighbouring Administrations in the TRASA region, most of which have already opened their VSAT markets. This international tension has arisen lately because, while South African companies are now eligible to receive VSAT licenses in most of the sub-Saharan nations, companies from those nations have no comparable opportunity to provide VSAT-based services in South Africa.

At least two consequences have become apparent as a result of South Africa’s VSAT regulatory approach: Officials of some TRASA Administrations have suggested that a “moratorium” be imposed on the provision of VSAT licenses to South African companies. And companies interested in providing VSAT services in the TRASA region are, instead of launching services from South Africa, obtaining licenses and building businesses in countries with liberalised VSAT regimes, such as Botswana, Malawi, Mozambique, and Zambia.

The contrast between Malawi’s and South Africa’s experience is striking: While enterprises in Malawi have begun to enjoy expanded access to communications via VSAT – and the regulator is considering licensing-fee reductions to further promote satellite-based Internet services to consumers – the South Africa Administration’s more restrictive approach has retarded local industry growth, and threatens the loss of political goodwill in the region.

The trend by African Administrations to apply satellite regulations that echo Malawi’s approach underscores a commitment to opening markets to the provision of satellite services in a manner wholly consistent not only with national policy objectives – which are being achieved through strengthened access to affordable business, consumer and government communications – but also with the goals of the World Summit for the Information Society (WSIS) and the World Trade Organization (see also Section 3.3.1).

4.3 LIBERALISATION AND UNIVERSAL ACCESS

As the trend toward fully liberalised VSAT markets continues to develop, several African Administrations interviewed for the IDRC Pan-Africa Satellite Survey expressed reservations about permitting an unlimited number of market participants to provide services. Much of the Administrations’ concern relates to reports that unlicensed service providers are eroding incumbents’ revenues – and thereby undermining their ability to provide, among other services, Universal Access.

However, it has been observed that, when a country limits competition through a restriction on the number of market participants, it may inadvertently encourage a form of “black market” to develop in which non-mainstream businesses attempt to provide services and meet consumer demand in violation of the government’s licensing requirements. The prevalence of non-mainstream service providers often makes it more difficult for governments to ensure compliance and enforcement with their regulations and licensing conditions.

Many countries have traditionally restricted the number of authorised terrestrial and satellite-based telecommunications service providers that are permitted to serve a country in order to support an implicit program of Universal Service for consumers. Specifically, many countries require that their dominant telecommunications provider subsidise the cost of local telephone services primarily by charging higher rates for long distance and international telephone services. Such a system of cross subsidies between different services is inefficient from an economic perspective and is difficult or impossible to sustain following a conversion to a competitive market. Competing international telecommunications service providers would be able to undercut the prices charged by the dominant operator for international telephony services, undermining the revenue base of the dominant supplier and potentially jeopardising the continued existence of implicit Universal Service offerings.

Countries throughout the world have discovered, however, that the solution to this dilemma is not to restrict the number of independent service providers, but instead to require all telecommunications service providers to contribute to the cost of Universal Service. This can be done either by:

1. Requiring all operators to pay a set percentage of their telecommunications service revenues into a Universal Service fund;
2. Requiring all operators to interconnect
with the dominant operator at interconnection rates that reflect the Universal Service subsidy and, as a result, compensate the dominant operator for the cost of providing Universal Service; or

3. Compensate the dominant operator for the cost of Universal Service through appropriations from the government’s general budget.

Experience in other countries has demonstrated that each of these approaches can be used to successfully maintain an explicit competitive environment that permits limited competition in the telecommunications marketplace.

4.4 CREATING TRANSPARENCY

The IDRC Pan-Africa Satellite Survey found that the African satellite regulatory process is severely lacking in “transparency”. The difficulty of obtaining information about VSAT regulation in Africa is so acute – and the demand for such satellite solutions is so great – that it has given rise to a lucrative business, attracting international consultants who sell the information to would-be satellite service providers. Indeed, addressing the obscurity of accurate information about African satellite regulation is a primary objective of IDRC, CATIA, GVF and, to a significant extent, the ITU Satellite Regulatory Survey. Transparent practices are critical to the success of satellite regulation, enabling parties to benefit in a variety of ways. Recognition of this fact has resulted in significant moves by Administrations worldwide to post their regulations and/or policies online.

With two exceptions, all respondents to the ITU-D Question 17/1 Satellite Regulatory Survey indicated that their laws, decrees and legal instruments were publicly available and in many cases are posted on the web. Sixty-eight percent of the respondents indicated that their license application forms were available, and in the majority of cases can be found on the web. But considerations of transparency are difficult to address. What is posted on websites, such as Kenya does for its tariffs, is often misleading or incomplete – which amount to the same thing.

A fundamental point on transparency is that most applicants try to obtain licences remotely – without visiting the Administration. In the absence of excellent personal relationships with the regulatory staff in the various governments, timeframes and process will always appear more complicated from a distance.

Applicants are not the only beneficiaries of transparency; Administrations also have much to gain. Online publishing of regulatory requirements is inexpensive, reduces the burden on Administrations (by reducing the need to respond to numerous individual inquiries), enables industry to more effectively provide services, and serves as an effective platform from which to promote regulatory harmonisation.

In addition, regulators rely upon transparency to safeguard their legitimacy and efficiency. Regulators also obtain information from the regulated industry and other interested parties that they need in order to base their decisions on all relevant facts and diverse views. Operators and service suppliers depend on transparency to ensure that their concerns are heard and that they play a role in shaping important decisions.

Further, transparency is extremely important in corporate decisions regarding potential investment in markets. For transparency to be

113 One residual phenomenon that can delay applications: many Administrations have Intelsat printed onto their applications. Where the ground network connects to another operator (for example, New Skies Satellites) it is sometimes necessary to demonstrate that waiving the requirement to connect to Intelsat does not need the special agreement of a senior or cabinet official.

114 See http://www.itu.int, “Satellite regulation in developing countries”.

115 See http://www.itu.int, ITU-D Question 17-1: “Satellite regulation in developing countries”.


117 Ibid.

118 For example, the U.S. Federal Communications Commission implemented VSAT blanket licensing more than 10 years ago. During a GVF Satellite Regulatory Workshop held during ITU WTDC in Istanbul, Turkey in 2002, an FCC speaker was asked what they would have done differently with regard to blanket licensing. Their response: “We would have done it sooner.”

119 These details were provided in a presentation given by Patrick F. Masambu, Executive Director, Uganda Communications Commission, during Satcom Africa 2004 on 17 February in Johannesburg, South Africa.

120 See http://www.itu.int, ITU Question 17-1: “Satellite regulation in developing countries”.

114
have its full effect, there must be systems and processes in place to allow regulators to gain valuable information, consult all stakeholders, render their decisions, and justify them based on the public interest and the facts provided to them. Evidence of transparency and unbiased decision-making will also help to incapacitate regulators from accusations of arbitrary, closed-door decisions for reasons of personal gain or to benefit a certain company or individual.

To facilitate this process, CATIA has begun co-ordinating with regional inter-governmental groups throughout Africa, such as TRASA and WATRA in West Africa, to establish an online One-Stop-Shop VSAT license-application framework that also includes public access to the VSAT regulatory requirements applied by each African Administration (see also Section 4). All African governments have been invited to participate in the programme.

4.5 STREAMLINING LICENSING

The ITU has called attention to the impact of the licensing process on the larger regulatory environment and the market as a whole, noting: “The licensing process can be one of the most important regulatory processes related to reform of the telecommunication sector. Licensing policy and its implementation determine the structure of markets, the number and types of operators, the degree of competition among them, the revenues earned by governments in opening markets, and, ultimately, the efficiency of the supply of the services to the market.”

Despite significant liberalisation gains made in recent years by African Administrations, VSATs are still among the most heavily-regulated technologies in the region, a fact that is most apparent in the realm of licensing. Licensing policies and their implementation determine the structure of markets, the number and types of operators, the degree of competition among them, the revenues earned by governments in opening markets, and, ultimately, the efficiency of the supply of the services to the market.


In the past, governments have developed policies to protect their countries’ satellite systems. These “Closed Skies” policies required service providers to use only locally-owned satellite capacity when providing VSAT services. Also, originally satellite operators such as Intelsat, Eutelsat and Inmarsat were inter-governmental organisations and owned by the PTOs around the world. Consequently, in the beginning space segment could only be bought via the incumbent PTOs.

But in the long run, governments are realising that tremendous demand for Internet, data, voice, video and other services is best addressed by policies that permit open and direct access to all satellite resources assuming that they have been properly co-ordinated through the ITU. The “footprint” of a satellite – the region of the Earth served by a satellite – does not match national borders, making it necessary to regulate this matter through international agreements.

This approach is being implemented worldwide. The ITU Satellite Regulatory Survey indicated that 34 of 54 responding Administrations allow space segment operators to provide services directly to end-users; of the African Administrations, about half of the survey respondents confirmed that they permit open links with end-users. When it comes to satellite network service providers being allowed to transmit and receive signals to and from foreign satellites, 46 of the 54 responding Administrations said they allow such communications.

While the ‘Open Skies’ policies being implemented today are not completely open, they all involve permitting increased direct access to orbital resources, regardless of the satellite operators’ country of origin. ‘Open Skies’ policies require satellite operators to compete for customers interested in obtaining C-band (4-6 GHz), Ku-band (10-20 GHz) and K-band (20-30 GHz) satellite bandwidth. It has been observed that this competition results in more options for local customers with a significant boost in quality and lower prices.

Meanwhile, as space segment providers move into the business of providing full end-to-end solutions in Africa, they are faced with the work of obtaining end-user licences for the customers for whom they are providing the network. There is no prohibition in any African Administration against the space segment provider obtaining an end-user licence, though it may not always be the most efficient route to take. As a rule of thumb, applications made in the name of the customer, though handled by the space segment operator, have proven to be effective in the African context. They expose the operator to less long-term risk by linking a customer’s ground segment licence with other rights and obligations of the network.

2. Spectrum Management and Licensing

The spectrum used via a satellite was historically distributed between the incumbent, military and related public service providers (police and emergency services). As countries began implementing ‘Open Skies’ policies, licensing of spectrum became an issue nationally. In particular, interference had to be minimised in the best interests of society.

Today, the ITU coordination process serves to avoid technical problems such as interference among global operators. Exclusive or primary bands are often allocated for Fixed Satellite Services (FSS) and Mobile Satellite Services (MSS) and spectrum sub-
segments are assigned to different operators through coordination. In such cases, it is not necessary to issue duplicate licenses to a foreign satellite operator or the spectrum associated with the foreign satellite because it has been coordinated and assigned by a foreign Administration and no infrastructure is being installed or operated in the country. Once inter-satellite coordination is accomplished at the ITU level, there is no further need to license spectrum use by networks operating in exclusive bands.

B) Ground Segment
In addition to licensing of the space segment, many administrations have created licensing regimes for the terrestrial segment of satellite networks. Efforts to require licenses for the ground segment can be divided into two groups – authorisation requirements for satellite service providers and individual licensing for earth station facilities. Both approaches are discussed below.

1. Service Provider and Network Operator Licensing. Many countries require that public-network operators hold licenses so that there is some quality assurance of the service being provided to their public. A few countries have adopted this rule also for private VSAT services. As the nature of private satellite services is being understood better, the application of this type of license is declining. As it is not a public service and not usually connected to the PSTN, and can be privately owned, it is increasingly the view of administrations that this is a redundant licensing process that causes time delays and confusion. These types of licenses can also be referred to as Service Provider Licenses, Value Added Service Licenses and sometimes certain types of Class Licenses.

2. Blanket Licensing and General Authorisations. Traditionally, most governments have required each VSAT or mobile satellite terminal to be licensed individually; this was in addition to requiring a network operator’s license. But more than 10 years ago, a new approach to regulating VSATs - “blanket licensing” - began to be implemented. With this regulation, VSATs are configured based upon technical criteria - involving power level, frequency, etc. - that elimi-
nate the risk of harmful interference. Thus, a single blanket license can be issued covering a very large number of VSAT terminals. Similarly, for mobile systems, international frequency co-ordination procedures, as well as the use of harmonised standards, eliminated the risk of harmful interference and a growing number of countries were able to exempt the circulation of terminals from individual licensing requirements.

Uganda implemented blanket licensing in order to reduce entry barriers in selected segments of the sector. The Uganda Communications Commission (UCC), in line with its 1996 policy objectives to "increase the geographical coverage of telecommunications services throughout the country" introduced blanket licensing in markets such as public communication bureaus and cyber cafés. (As a result of sector liberalisation, the number of cyber cafés increased from 0 in 1996 to 147 in 2003). Further, UCC waived the requirement to pay license fees for these service-provider categories.119

These approaches have worked well for the regulator, for the industry, for end users, wherever it has been applied, including Administrations not only in Africa, but also in North and South America, Asia, and Europe. The following graphs indicate by terminal and by region those found by the ITU to have provisions for blanket or class licenses120. (Note: Several Administrations in the Americas region including for example Brazil, Honduras and the U.S. have implemented blanket or class licensing, but were not reflected by the ITU Survey results.)

While approximately 50% of African Administrations responding to the ITU Survey question on the subject said blanket licensing is applied to two-way VSATs, almost none of the respondents to the IDRC Pan-Africa Satellite Survey confirmed that blanket licensing had been applied to two-way VSATs (see Chart 9). This discrepancy can be explained by the fact that, with only a couple of exceptions, different groups of African nations responded to the two surveys. By combining both sets of results (to include a total of approximately half of all African Administrations), more than 25% of the survey respondents have applied some form of blanket licensing in Africa.

Another finding of the ITU and IDRC surveys was that the majority of African Administrations either do not apply any licensing to receive-only systems – whether they are used for video or data – or they apply blanket licensing. The rationale behind this fact is that, in theory, the verifiable purpose of licenses is public safety and preventing harmful frequency interference; receive-only systems, because they do not transmit, are incapable of creating interference or of posing a radiation hazard, so licensing need not be applied. These approaches can also be observed in the Americas, where the 35 countries of CITEL have adopted a Resolution advocating the implementation of VSAT blanket-and class-licensing throughout the region (see also Section 4), as well as in Europe where, since 1998, 46 Administrations have adopted – and more than a dozen have implemented – regulatory principles relating to streamlined licensing of VSATs, either for receive-only terminals or interactive systems.

Meanwhile, the trend toward streamlined satellite licensing approaches is becoming even more simplified. In Europe, for example, under the terms of the new EU Authorisation Directive,111 EU countries have begun to implement a “general authorisation” system. As opposed to blanket licences - which are still administrative acts or explicit decisions - general authorisations no longer require license applications to be made prior to providing service or running a network. Administrations might require a notification, including basic information on the operator, the network location, the type of service provided, etc. However, the service can be offered under general authorisation and cannot be put on hold awaiting a reply or consent of the Administration. European Administrations that have begun to implement the approach have described it as an important step forward in the development of satellite licensing approaches that maximise access to new services121. General authorisation also recognises fully the international nature of satellite services, whereby there is no need to have a service provider located in each country. It overcomes, therefore, the difficulty of obtaining blanket licences in countries where a small number of terminals belong to several service providers, or where foreign ownership restrictions require the establishment of a national presence.

4.6 LICENSING FEES

Implementation of general authorisations or blanket licensing results not only in faster implementation of service, but also lower costs of implementation122. This derives from the fact that with individual licensing of terminals or services, licensing fees are often imposed on the use of individual terminals – which is likely to make the service unaffordable to potential end users - or on each of the service providers and require more administrative work on behalf of the regulator or responsible national body.

This is evident across Africa, where fees charged to provide VSAT-based services using even a single antenna vary enormously. The actual costs - as distinct from those that may be listed on government websites - are for the most part defined by the parameters of the network. For example, in Eritrea and Ghana, fees are affected by the number of earth stations in the network123. Other Administrations charge initial one-time fees that do not vary as a function of network size. These range anywhere from US$500 - $15,000, and the higher the fee, the less likely it will be that an enterprise is able to obtain access to VSAT-based services, much less an SME, SOHO or consumer. This problem is often compounded, because of a wide assortment of other licensing fees that must be paid, such as:

- Hub fees (e.g. FCFA 300,000 in Burkina Faso);
- Recurring annual fees (e.g. Malawi’s $2,500 fee);
- Recurring fees as a function of traffic throughput (e.g. Benin’s $1,150/64Kb or Zimbabwe’s $7,078/64Kb);
or
- A levy on turnover, (e.g. 2.5% of gross turnover in Nigeria, 3% in Tanzania).

In general the aggregate effect of these license fee systems act to limit the economies of scale in large VSAT networks, as the more sites there are, the greater the annual cost. As

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**Chart 9: Blanket Licensing Implemented? Source: IDRC Pan-Africa Satellite Survey**

<table>
<thead>
<tr>
<th>Terminal Type</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-Way Video</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>One-Way Data</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Two-Way</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

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**Satellite Licensing: Regulators’ Checklist**

- License Only to Prevent Harmful Interference
- Apply Technology-Neutral Licensing
- Avoid Bilateral Fees
- Apply Minimal / No Fees
- Optimise Application Processing

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**OPEN AND CLOSED SKIES: SATELLITE ACCESS IN AFRICA**

47
Under the Netherlands Telecommunications Act, licenses are required for the use of frequencies and therefore a license is required to operate a VSAT earth station, with the exception of receive-only and mobile satellite terminals. The license can be applied for by the actual user of the earth station or by a network provider. There are three categories of licenses:

- SG10 VSAT networks (including a hub station in the Netherlands)
- SG20 One-way up-links for data and broadcasting
- SG30 Satellite News Gathering installations

The regulation for small VSAT terminals has been relaxed in the Netherlands since June 15, 2001. This change occurred in response to an increased demand for on-line broadband Internet and data communications by the business and private sectors, and the opportunity to expand these technologies via satellite. Under the following circumstances, a VSAT license is no longer required in the Netherlands, assuming the VSATs:

- Operate in the following frequency bands: 14.0 – 14.25 GHz (Earth to Space) and 10.7 – 12.75 GHz (Space to Earth);
- Have a maximum transmitter power of 2 watts and maximum EIRP of 50 dBW;
- The antenna is located at least 55 metres away from airfield boundaries as referred to in the Aviation Act.

Network operators; there may be customs duties to be paid (up to 47% of equipment value), surtaxes (up to 20%), extended surtaxes (up to 17.5%), value-added tax (up to 15%), fees to be paid to the incumbent PTO, equipment-inspection fees, spectrum fees (up to $2000/18MHz), percentages of share capital, percentages of revenues for PSTN access (up to 0.5%), development levies (up to 0.5%), administration fees, regional levies (up to 0.5%), surcharge for use of non-intelsat bandwidth (up to 50%), and more.

While not a fee, per se, some Administrations require a VSAT network operator to establish a local hub (see also following sub-section), which can add $250,000 - $1 million in equipment costs, plus installation, commissioning, maintenance, staffing, further payments of customs duties, VAT, and other associated costs. This requirement not only adds significantly to the cost of deployment, but it may force would-be service providers to invest in infrastructure, even where there may already be a sufficient supply available, either from local or international sources.

There is also a correlation between high fees and the presence of oil reserves. Prices in Angola, Cameroon, Gabon, and São Tomé and Príncipe (and formerly Nigeria) are all unusually high compared with most of the rest of Africa. With the exception of the slightly opaque pricing schemes of Kenya, Eastern and Southern African Administrations charge the least onerous fees. Specifically, fees should not exceed the average resource hours required to process an application. When fees are raised for the provider, fees are in turn raised for the customer, which is prohibitive to competition, fair prices and universal service offerings. Utilising fees to compensate for administrative costs also helps to promote the independence of the regulatory agency, by freeing the agency from dependence on the government’s general budgetary process.

In addition to publicising rules regarding satellite licensing, it has been demonstrated that clearly defining fee structures for the public without discrimination promotes investment. Companies assess expected costs be-

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**Mauritius: A Technology-Neutrality Snapshot**

- Mauritius’ telecommunication sector has been liberalised since the promulgation of the Telecommunications Act;
- The Information and Communication Technology Authority is the IT and telecom sector regulator that licenses operators;
- Licensing in Mauritius is both technology and service neutral;
- Operators can apply to provide physical infrastructure, network services or applications;
- Those who apply for network services can establish or lease physical infrastructure;
- Those who apply can automatically qualify for a network and physical infrastructure license.

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**Chart 10: African Commercial/ Legal Presence Required?**

Source: IDRC Pan-Africa Satellite Survey.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Space Segment</strong></td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Ground Segment</strong></td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

ISP are the most prolific suppliers of Voice over Internet Protocol (VoIP) services, and it is precisely the restricted opportunities to offer new VoIP services that are so clearly indicated by the respondents to the ITU-D Question 17/1 Survey. Of the Administrations that indicated they did effect service—specific regulation for satellite-based services (17 of a total of 58 respondents), a significant proportion declared that it was VoIP against which there were the most stringent restrictions, or outright prohibition. In some cases the national Administration was open in stating that this prohibition was in favour of retaining the national telcos’ voice telephony monopoly.
VSAT Licensing Case Study: Norway

Norway implemented the CEPT “VSAT” Decision [ERC/DEC(00)05] on an early stage. This was very easy for the Administration, because our VSAT licensing was more like a formality, and already very close to “free use” or license exemption. The regulator did no frequency planning in the Ku-band (this is taken care of by the satellite operator), no frequency co-ordination, gave no protection, and any case of interference should be resolved among the parties.

Further, the whole uplink band 14.145 GHz was utilised by VSAT and Satellite News Gathering (SNG) only (no fixed services), all users got access to the whole uplink band (no individual frequency assignments). There were no geographical restrictions in this band; the licenses were valid all over the country if the operator so wished. Further, there was no power limitation; the operators normally got what they applied for. And, what is really important in this context, the regulator did not recognise any problems in this frequency band in Norway.

The regulator therefore started to think if the licenses for VSATs and SNGs were really needed. They also asked if the ERC/DEC(00)05 could be extended to fit all VSATs and SNGs. In many cases, the current regulation with regard to VSAT and SNG already represents an extension of ERC/DEC(00)05, but they still had to issue licenses because a general authorisation was not given through national regulation.

So, what they did thereafter was to arrange a public inquiry where they proposed license exemptions for all VSATs and SNGs. The proposal applied to all VSATs and SNGs that comply with the relevant standard of the European Telecommunications Standards Institute (ETSI). Airports were to be excluded and the power limited to 80 dBW effective isotropic radiated power (EIRP). Thus, there would be no licensing in the Ku-band at all.

The “price to be paid” is that SNGs no longer may be used at airports; the operators have to find other solutions. Beyond that, the response has been very positive. To formalise the proposal on license exemption, the regulator had to incorporate it in their national regulation on “general authorisation”. After public consultation, this regulation was implemented as follows:

After revising the national regulations on Authorised Frequency Use (exemption from individual licences) in Norway, almost all VSATs and SNGs in the frequency bands 14/12 GHz may be used without applying for an individual frequency license. The technical requirements for licence exemption are:

A. Satellite terminals (VSATs) are authorised to use the frequency bands 10.7 – 12.75 GHz (downlink) and 14.0 – 14.5 GHz (uplink) in accordance with the frequency use described in CEPT/ERC/DEC(00)05. Antenna diameter is up to 3.8 metres. Maximum allowed radiated power is 80 dBW EIRP. These provisions do not apply to Svalbard or within 500 M of airfields.

B. Mobile satellite terminals (Satellite News Gathering [SNG]) are authorised to use the frequency bands 10.7 – 12.75 GHz (downlink) and 14.0 – 14.5 GHz (uplink) in accordance with the frequency use defined in the standard EN 301 430. Antenna diameter is up to 5 metres. Maximum allowed radiated power is 80 dBW EIRP. These provisions do not apply to Svalbard or within 500 metres of airfields.

General: Use of frequencies that are exempted from individual licenses is not protected against interference from other legal frequency usage. No service licenses are needed for satellite services in Norway. (Note: Other classes of satellite earth stations/satellite terminals are licence exempted in Norway. A list of those classes can be seen at www.npt.no.)

cost structure for satellite infrastructure and services is unique, when compared to other telecommunications sectors, particularly the high cost of placing space stations in orbit. Moreover, satellite footprints are cross-border in scope, and thus are not localised in any way. Administrations increasingly are recognising the implications of such cost structures on economies of scale and scope in assessing the effective competitiveness and resultant need for light touch regulation of such markets [12].

4.7 ADDRESSING COMMERCIAL OR LOCAL PRESENCE

The Satellite Survey revealed that numerous African Administrations maintain commercial or local-presence requirements. While, these conditions are more commonly applied to the Ground Segment than the Space Segment (see Chart 10131), the impacts and costs of establishing a commercial local presence have nonetheless been reported by African VSAT network operators to be far-reaching (see also previous sub-section) [12].

Foreign ownership rules are capable of complicating the entire process of incorporating a company within a jurisdiction. In addition, even after a local presence is established, local partners in such arrangements may gain inequitable benefits. It has been asserted that foreign ownership restrictions are generally contrary to the spirit if not the letter of foreign trade agreements including the General Agreement in Trade in services (GATS) addressed later in this Report.

Some African Administrations require a VSAT network operator’s hub to be installed within that Administration’s country (such as Algeria’s re-regulatory plans as reported above). However, some African Administrations have begun to rethink the practise. This became evident in March 2003, during a VSAT Regulatory Seminar held in Abuja, Nigeria, in conjunction with WATRA’s First Annual General Meeting. Action has yet been taken in this regard, but the fact that it is now on WATRA’s agenda – and indeed that VSAT regulation was the subject chosen for the seminar held in conjunction with the organisation’s first AGM – suggests that this will be an important part of the regional regulatory dialogue.

The trend to minimise or eliminate local presence requirements extends well beyond Africa. Administrations increasingly recognise that satellite telecommunications services are an important adjunct to terrestrial services and should not be deemed an infringement to terrestrial lines and restricted by local-hub requirements.

Similarly, numerous Administrations no longer believe that the public interest is served by geographic-service restrictions. In some countries, competitive VSAT services are only permitted in “Technology Parks”, certain “Free Trade Zones”, embassies and selected multinational organisations. If the services are beneficial in these cases, they also will bring important benefits to all regions within a country - especially rural areas, educational institutions and hospitals.

4.8 TECHNOLOGY NEUTRALITY AND CONVERGENCE

As elsewhere, in Africa, technology neutrality is the new trend as regards the provision of satellite services [13]. Administration representatives have long called for a “leap-frogging” of technology from those building out African networks; the interest in the latest equipment and technologies is therefore a long-established policy. To the extent that satellites are regarded as “new” technologies (though clearly it is more accurate to say their applications are, or can be, new), those providing satellite services are regarded as being in the vanguard of telecommunications operations.

The Botswana, Mauritius and Ugandan Administrations’ current technology-neutral approaches to satellite regulation provide an example of governments’ recognition that modern telecommunications services are being provided to consumers using a number of different technologies, such as wireline, satellite and terrestrial wireless networks [14]. In order to facilitate effective use of – and fair competition between - these technologies, regulators increasingly are making their regulations, licensing requirements and regulatory fees technologically neutral. (A majority of 37 ITU Question 17-1 Satellite Survey respondents indicated that their regulatory regimes did not impose any service-specific regulations for satellite-based services.)

For example, an authorized ISP would ideally be able to select either a terrestrial (wireless or wireline) or satellite-system architecture.
to build its network, based solely on the relative costs and benefits of each available technology. By contrast, if discriminatory regulatory requirements make one or more of these technologies relatively unattractive, the ISP will likely be forced to choose the technology that is least encumbered from a regulatory perspective, rather than the technology that can provide the best service at the lowest price.

ISPs are the most prolific suppliers of Voice over Internet Protocol (VoIP) services, and it is precisely the restricted opportunities to offer new VoIP services that are so clearly indicated by the respondents to the ITU-D Question 17/1 Survey. Of the Administrations that indicated they did effect service-specific regulation for satellite-based services (17 of a total of 58 respondents), a significant proportion declared that it was VoIP against which there were the most stringent restrictions, or outright prohibition. In some cases the National Administration was open in stating that this prohibition was in favour of retaining the national telcos’ voice telephony monopoly.

In order to ensure that regulations are technology-neutral, regulators increasingly are limiting their regulations and licensing requirements for satellite services, using them solely to protect the public safety; and manage scarce public resources, such as frequency spectrum when there is more than a negligible risk of harmful interference.

4.9 MANAGING SPECTRUM

Regulation of satellite and other radiocommunications services is necessary to manage scarce spectrum resources. This is particularly true in those limited cases in which satellite services share a co-primary location with other radiocommunications services in the same frequency bands1. In many frequency bands, however, satellite services do not share the same spectrum with other radiocommunications services, and Administrations throughout the world increasingly see no reason for regulators to place any restrictions on satellite networks that have been licensed or authorised by other Administrations and have completed spectrum coordination through the ITU. In stead, regulators in each country have begun to only impose licensing and spectrum coordination requirements on satellite networks that are based in that country. Such an approach ensures that spectrum resources are used efficiently, by requiring each and every satellite network to secure a license from its country of origin and coordinate spectrum through the ITU. These same factors are now being employed with respect to owners and operators of satellite earth stations. VSAT and receive-only earth station terminals do not raise concerns about the use of scarce spectrum resources to the extent that the VSATs are communicating using satellites (either domestic or foreign) that have completed the ITU spectrum coordination process. Thus, no spectrum-related regulation is appropriate for satellite earth station operations.

Despite this fact, some Administrations employ a registration process, whereby a foreign satellite operator, or an operator of a VSAT network is requested to provide the details of its headquarters and to provide a contact in case of any questions or problems. A copy of the ITU coordination filings - as well as of the company’s incorporation status with a contact name - should be considered sufficient information by national regulators for granting land ing rights to foreign satellites, or approvals to operate earth stations.

As spectrum demands continue to increase globally, it will be more important for Administrations and satellite operators cooperatively to pursue ways of ensuring that maximum utilisation of available spectrum resources can be achieved2. This principle applies with particular force for satellite systems operating in designated exclusive bands, whether intended for VSATs or mobile satellite services. As such, the regulatory regimes in place need to focus on avoidance of harmful interference. They should not be utilised as a basis for restricting access, such as in the case of satellite networks licensed or authorised by other Administrations and accessed as part of the ‘Open Skies’ environment.

In this vein, there are a number of trends occurring around the world of considerable relevance to African Administrations. Perhaps one of the most noteworthy is the current spectrum regulatory reform movement in many countries is increased interest in or consideration of the use of so-called market-based allocation methodologies (i.e., auctions) as a preferred means for spectrum allocation decisions, as well as expanded opportunities for use of spectrum-related fees in connection with licensing activities. This is based on the rationale either of promoting greater efficiency in actual spectrum utilisation and/or exploiting creative ways of generating additional revenue sources for Administrations.

Irrespective of how this may (or may not)
work in other areas, given the regional/global character of the provision of satellite services, reliance on auction-based allocation mechanisms can be fraught with considerable difficulties. At a minimum, it can subject a global or regional satellite operator to considerable uncertainty with respect to the cost of ensuring that its service is able to provide service.

Even in those instances where Administrations seek to employ such policies only with respect to domestically licensed satellite operators, such practices inevitably lead to concerns about the absence of a level playing field between domestic and foreign operators, with the consequence of increasing pressure for restrictive rather than permissive market access policies imposed upon satellite operators. As the European “3G” experience clearly demonstrates (as one example), auctions have done little to promote increased availability of affordable and innovative service offerings. While so-called “cost-recovery principles” for spectrum-related regulatory activities may be difficult to question, the perception of spectrum as an attractive new source of governmental revenue generation poses significant concerns. At the end of the day, it is effectively nothing more than a tax to be paid by the ultimate end user of any telecommunications service provided.

Nevertheless, radio frequency spectrum is a scarce resource and national Administrations need to provide access to it for all radio communications users in an optimised way. In this respect, the satellite industry continues to be burdened by spectrum limitations, either through reallocation of vital frequency allocations to terrestrial users or through unduly constraining mitigation techniques. This has the unfortunate effect of hampering services to remote regions of the world where satellites constitute a critical telecommunications link.

There are terrestrial technologies that have the potential – and the commercial interest – to make use of either C- or Ku-band spectrum in Africa. As has been demonstrated at various multi-lateral spectrum meetings over the past five years, African Administrations are interested in realising the uses of this spectrum for satellite services as they are for other immediately available technologies such as wireless local loop (lower C-band) and fixed point-to-point links (upper C-band).

4.10 OPTIMISING EQUIPMENT CERTIFICATION

Approximately US$135 billion in telecommunication and information equipment is affected by type-approval processes throughout the world each year, a significant percentage of which is satellite-based systems. These type-approvals costs are passed on to consumers in the form of higher equipment prices, and an additional layer of expense is often added when Administrations require type-approval testing and certification for satellite terminal equipment already tested and certified by other Administrations.

In Africa, the current state of type approvals and equipment-registration requirements for satellite earth stations suggests a strong interest in streamlining these traditional processes in order to lower consumer prices and enable more cost-effective access to satellite services. The IDRC Pan-Africa Satellite Survey shows that most African Administrations are content to recognise the type-approval marks that apply elsewhere in Africa (such as ICASA in South Africa), as well as in Europe, the United States and China. Where type approval matters are raised in Africa, it is often for reasonable reasons, to do less with equipment’s failure to meet a standard than the services or end users that are associated with the network.

The ITU-D Question 1/17/1 Survey made a similar finding: Responses indicate that there is a trend towards accepting international or regional standards on unwanted emissions during the type approval of FSS and MSS earth station terminals. Of the respondents, the majority of nations surveyed in every region recognise Mutual Recognition Agreements (MRAs), with a total of 38 out of 50 countries indicating acceptance. Africa’s proportion is higher, with 37 countries recognising MRAs, versus only one that does not.

African Administrations’ interest in minimising costs associated with type approvals is shared by a growing number of countries throughout the world that mutually recognise type approvals issued by other Administrations – whether on the global level through the ITU GMPCSMEO or through regional mutual recognition agreements such as those applied by the Asia Pacific Economic Economic Cooperation group and the Inter-American Telecommunications Commission. In order to help facilitate use of the MRA process for satellite-based systems, the private sector has also offered a solution. A technical framework that enables Administrations to mutually recognise tests results generated during the satellite operator type-approvals process. This framework is encapsulated in a document entitled “GVF 101: Mutual Recognition of Performance Measurement Guidelines and Procedures for Satellite System Operator Type Approvals” (see Sources & Resources). It defines a set of standardised measurements that can be used to check compliance of an earth station antenna model with applicable performance requirements. The procedure also provides for independent auditing of the accuracy and completeness of the data by Authorised Test Entities, which are elected by satellite-operator members of the GVF.

The availability of a standardised, audited data package alleviates the need for each country to maintain its own testing and verification requirements, reducing costs for Administrations and improving the quality and comprehensiveness of the data submitted to regulators as a part of the licensing or type approval process. At the same time, acceptance by domestic regulators of a standardised data package can greatly reduce costs for satellite service providers, by permitting them to use a single set of tests and data to demonstrate compliance with the technical requirements of both satellite operators and domestic licensing officials in multiple countries.

However, other Administrations are bypassing mutual recognition to go a step further. A good example is Ghana, which reported that it has begun to apply self-declaration of conformity by manufacturers. This approach, which shifts responsibility for type-approval testing and certification from the Administration to the manufacturer, is also in line with global trends: Overall, 45 of 56 nations that responded to the ITU Satellite Regulatory Survey question on type approvals allowed self-declaration.

Self-declaration of conformity by manufacturers has significant advantages over type approvals. The practise removes an unnecessary burden from Administrations, and also enables all participants – manufacturers, Administrations and end users – to avoid delays and added costs associated with traditional type-approval processes.

While it is relatively new, it has already been proven to be effective, even on a regional scale: The European Community has implemented legislation that eliminates government type approvals of satellite and other telecom terminals, introducing harmonised standards and certification procedures to be issued by independent laboratories. This change is being brought about with the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (the “R&TTE Directive”), which introduces a system based on manufacturers’ declaration of conformity and relaxation of the regulatory constraints on the free movement and putting into use of terminal equipment. Although satellite communications services can be provided on a universal and cost-effective basis to both large and small users, in certain circumstances measures must be taken in order to ensure that satellite transmission devices do not pose a radiation hazard threat to the public. Regulations and licensing conditions that can be used to protect public safety include: restrictions on physical accessibility of transmission equipment (i.e., use of fencing, secure areas and warning signage), restrictions on the design and configuration of transmission equipment in order to ensure that transmissions do not exceed appropriate levels (homologation, type approvals, self-declaration of conformity), and restrictions on the proper installation and use of transmission equipment (i.e., requiring adequate training for equipment installers and operators).

4.11 ACHIEVING CONTENT NEUTRALITY

Content is not addressed in the applications to provide VSAT service in sub-Saharan Africa. This is not to say that the Administrations are indifferent to content, however, the nature of the content is not addressed during the application process except as it is used to define the service (e.g., ‘corporate Intranets’ or ‘data transmissions’).

Satellite networks can be effectively used to provide all forms of telecommunications services. As a result, Administrations that regulate content often apply those regulations to satellite operators. For example, some countries still maintain limits on the number of carriers that are permitted to provide international voice traffic. Other countries restrict the provision of private line resale services, call-back services, or international carriage of VoIP. Administrations increasingly are opting not to...
to place restrictions on the content of international telecommunications services, because restrictions on the number and types of international carriers that serve a country serve only to erode competition and raise prices for customers. Some countries use revenues from international telecommunications services to help subsidize and reduce the costs of local telecommunications services. But these implicit universal support mechanisms are still being maintained in a fully competitive market through the imposition of universal service fees on international carriers, or through interconnection requirements.

In any event, content restrictions that are being imposed by Administrations should be technology-neutral - applying equally to satellite-based and wireline telecommunications service providers. Since satellite networks can be used to provide all forms of telecommunications services, no country should limit the number of satellite licenses that are issued in an attempt to restrict certain types of content.

4.12 ENFORCING COMPLIANCE

All operators face the risk of fines, suspension or annulment of licences, and confiscation of their equipment if they are discovered to be operating without a licence, whether they are in an African country or elsewhere in the world. Operators are particularly at risk using C-band, which continues to be heavily used in the world. Operators are particularly at risk using C-band, which continues to be heavily used for terrestrial services. The highest fine - as reported anecdotally - to be levied against a VSAT service in recent years was US$1,000,000 in the Republic of Nigeria.

Most countries have little difficulty securing enforcement of telecommunications laws, regulations and licensing conditions, including regulations for the satellite sector. In order to maximise industry compliance, laws and regulations are being designed in recognition of the fundamental characteristics of the business community - particularly business customers – will purchase services from mainstream business as opposed to non-mainstream businesses. Furthermore, mainstream businesses are often willing to help the government regulate and “police” the participants in an industry segment in order to help eliminate unfair competition from non-mainstream business ventures. As a result, the best way Administrations have found to ensure compliance with laws, regulations and licensing conditions is to establish a strong mainstream business community through the adoption and use of objective, transparent and predictable laws, regulations and licensing conditions.
Global Regulatory and Policy Trends
Global Regulatory and Policy Trends

5. GLOBAL REGULATORY AND POLICY TRENDS

Global trends in the regulatory and policy arena continue to move towards promoting active competition in all sectors of the telecommunications marketplace. Amongst the first needs for a competitive market is a legal and regulatory framework that does not discriminate in favour of existing service providers, or otherwise limits the number of independent service providers that are permitted to provide telecommunications services to consumers. Vigorous competition between a large number of service providers is being seen to encourage investment in infrastructure, provision of new services, improvements in quality and availability of lower prices.

The World Trade Organization (WTO) is dedicated to lowering or removing trade barriers in order to provide the open and competitive markets. The General Agreement on Tariffs and Trade (GATT) forms the basis of the WTO process. Key GATT issues for the satellite industry include non-discriminatory market access, open borders for competitive access, 'Open Skies' policies, transparency in telecommunications regulation, and licensing.

The Global Mobile Personal Communications by Satellite Memorandum of Understanding (GMPCSMoU) allows satellite operators to provide truly global service. GMPCs is officially defined as a personal communication system providing trans-national, regional or global coverage from a constellation of satellites accessible with small terminals. The GMPCsMoU facilitates arrangements for not only licensing but also type approval, marking, provision of traffic data, and customs recommendations related to the free circulation of GMPCs terminals.

ITU Radio Regulations govern the use of spectrum on an international basis. Satellite operators use the ITU coordination process to avoid technical problems such as interference. Other global frameworks facilitate effective regulation for specific applications. The Tampere Convention enables the rapid use of communications for disaster-recovery situations, particularly with regard to regulatory treatment. These global frameworks are analysed in more detail in the sections below.

5.1 WTO: MAKING SATELLITE COMMITMENTS

Following the Uruguay Round of trade talks in 1994 and the execution of the General Agreement on Trade in Services (GATS), participating States concluded that issues concerning liberalisation in the telecommunications sector were too sector specific to be fully addressed by the general regulatory principles set forth in the GATS. Therefore, on February 15th 1997, negotiators representing 68 countries concluded an agreement on basic telecommunications ("BTA") thus giving rise to the regulatory disciplines contained in the GATS and the Telecommunications Annex of the GATS applicable to all telecommunications services included in the WTO Member's schedules, plus broad regulatory principles unique to the BTA, embodied in a document known as the "Reference Paper".

On 5 February 1998, the results of the WTO negotiations on market access for basic telecommunications services formally entered into force. At close of the three-year negotiations, in February 1997, the commitments of 69 governments (contained in 55 schedules) were annexed to the Fourth Protocol of the GATS. The world's industrialised countries all participated in the deal. More than 40 developing countries large and small from virtually every region of the world also took part as did six of the Eastern and Central European economies in transition. The markets of the participants accounted for more than 91% of global telecommunications revenues. Moreover, since the negotiations, other participants in the Protocol increased their commitments and other WTO members who had not participated submitted commitments on basic telecommunications to the Council for Trade in Services.

For satellite-related communications, 39 schedules (53 governments) committed on some or all types of mobile satellite services, and 38 schedules (52 governments) committed on fixed satellite services. In addition, 10 governments scheduled commitments on value-added telecommunications services, which in some cases included satellite communications.

The WTO GATS requires member countries to refrain from imposing certain types of quantitative restrictions, economic needs tests, or local incorporation requirements. This means that a WTO Member may not maintain limits, such as a cap on the number of service suppliers or the corporate form in which a service can be provided.

Those WTO Members that undertook market access commitments in basic telecommunications services also became subject to GATS requirements on domestic regulation of those services. For example, domestic regulation of telecommunications services must be administered in a reasonable, objective, and impartial manner. Many WTO member countries undertook additional specific commitments regarding pro-competitive regulatory principles. The Reference Paper on Pro-Competitive Regulatory Principles obligates governments to adopt measures that prevent anti-competitive conduct, ensure fair, non-discriminatory and cost-oriented interconnection, and administer universal service obligations in a competitively neutral manner.

A second area that was addressed by the WTO Fourth Protocol on Basic Telecommunications Services is 'Open Skies'. The GATS requires WTO Members to provide all service suppliers of other WTO countries with Most Favoured Nation ("MFN") treatment. The MFN is a non-discrimination rule that requires a WTO Member to treat companies from other WTO Members the same as it treats its own companies. The WTO agreement also requires countries to provide companies from other WTO countries with Most Favoured Nation ("MFN") treatment. Essentially, MFN is a non-discrimination rule that requires each WTO Member to treat all other WTO Members similarly.

Despite broad support from Administrations for the initiative, of 51 African countries, only seven made commitments in the WTO Agreement on Basic Telecommunications Services: Côte D’Ivoire, Ghana, Mauritius, Morocco, Senegal, South Africa, and Tunisia (see...
GMPCS-MoU: IMPLEMENTING THE ARRANGEMENTS

GMPCS as an acronym stands for “global mobile personal communications by satellite.” The definition actually encompasses both mobile and fixed satellite systems, whether or not they are regional or global, planned or existing, narrow- or broadband, or rely upon geostationary or non-geostationary orbits, planned or existing, regional or global, and service-oriented personal communications by satellite. The GMPCS-MoU, which is scheduled for at least some products in their ITA undertook to bind their ITA commitments by the year 2000. Countries committing to the ITA undertook to bind their ITA commitments by the year 2000. Countries committing to the

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5.2 GMPCS-MoU: IMPLEMENTING THE ARRANGEMENTS

GMPCS as an acronym stands for “global mobile personal communications by satellite.” The definition actually encompasses both mobile and fixed satellite systems, whether or not they are regional or global, planned or existing, narrow- or broadband, or rely upon geostationary or non-geostationary satellites. A GMPCS-based licensing framework can therefore be effectively applied to any satellite network that may be intended to provide service in any country.

The GMPCS-MoU is a cooperative framework signed by Member States, GMPCS System Operators, GMPCS Terminal Manufacturers and Service Providers to memorialise the non-contractual and non-legally binding terms of their cooperation. As of June 15, 2003, there were 164 signatories to the GMPCS-MoU.

The objective of the cooperation is to allow GMPCS subscribers to take their terminals anywhere and, more importantly, to use them in countries where they are licensed. The final text of the GMPCS-MoU was adopted on 18 February 1997. It contains six articles dealing with type approval of terminals, licensing of terminals, marking of terminals, customs arrangements, access to traffic data and review.

5.3 ITU RADIO REGULATIONS: CO-ORDINATING SATELLITE SERVICES

ITU Radio Regulations govern the use of spectrum on an international basis. Satellite operators use the ITU coordination process to avoid technical problems such as interference. Once a country has implemented an ‘Open Skies’ policy, there should be no need for additional licensing of satellite operators, and the satellite industry strongly supports the ITU’s intersystem co-ordination efforts and firmly believes that no additional spectrum-related regulations are appropriate for satellite earth station operations.

The prime significance of the ITU Radio Regulations in the satellite context is as the means by which different Administrations are able to coordinate satellite networks in order to avoid harmful interference and to allow for maximum efficient utilization of the orbital resources, whether geo-stationary or non-geo-

5.4 THE GMPCS-MoU AND ITS ARRANGEMENTS

5.4.1 The Implementation and its Arrangements

5.4.2 The Implementation and its Arrangements

5.4.3 The Implementation and its Arrangements

The implementation and its arrangements are crucial for the success of the GMPCS-MoU. They consist of 29 articles (dealing with general principles and obligations such as “Most Favoured Nation” M.F.N. and National treatment); 8 Annexes (dealing with rules for specific sectors); and 130 (individual country’s specific commitments to provide access to their markets) schedules of commitments on specific service sectors.

5.4.4 The Implementation and its Arrangements

5.4.5 The Implementation and its Arrangements

The GMPCS-MoU and its Arrangements.
stationary in nature. As such, they are of critical importance to the spread of satellite technology and maximization of the benefits available from that technology.

The spectrum used via a satellite was historically distributed between the incumbent, military and related public service providers (police and emergency). As countries were able to access foreign satellites (implementing ‘Open Skies’), licensing of spectrum became an issue nationally, to ensure that no interference could occur and that the overall public interest would best be served.

Today, the ITU coordination process serves to avoid technical problems such as interference among international operators. Exclusive bands are often allocated for FSS, BSS and MSS services and spectrum sub-segments are assigned to different operators through coordination. In such cases, it should not be necessary to issue a duplicate license to a foreign satellite operator or to separately license the spectrum associated with the foreign satellite, because it has been coordinated and assigned by a foreign administration and no infrastructure is being installed or operated in the country. Once satellite inter-system coordination is accomplished at the ITU level, there should be no further need to license spectrum use by networks operating in these exclusive bands.

This strategy expects that regulators in each country need only impose licensing and spectrum coordination requirements on satellite networks that are based in that country. Within a particular country, the preferred means for spectrum allocation among national satellite operators directly licensed by that country’s regulatory authorities should generally be at the discretion of that Administration, so long as such procedures satisfy minimum requirements for transparency and non-discrimination.

It is important, however, that any such procedures do not have the effect or intent to discriminate against foreign satellite operators in ways that would restrict market access or the ability of licensed earth stations (receive-only or two-way) to access the foreign space segment. National policies that potentially impact spectrum licensing practices of other countries serve to undermine the benefits otherwise accruing from an ‘Open Skies’ environment.

The ITU Radio Regulations apparatus presently serves as the optimum means for efficiently and fairly discharging such intersystem coordination activities, as well as for ensuring individual Administrations (especially as an ITU member) that the assignment and registration of frequencies and orbital position to foreign satellite systems will respect the rights of that Administration’s national satellite system(s).

A copy of the ITU coordination filings, as well as of the company’s incorporation status with a contact name, should be considered sufficient information by National Regulators for granting landing rights to foreign satellites. Any duplication of these procedures causes delays and increases the costs of the foreign satellite operators, and serves to discriminate against the satellite industry.

Provision of space segment should solely be governed by the ITU inter-system coordination through the Radio Regulations. Thus, no spectrum-related space-segment regulation is appropriate for satellite earth station operations.

5.4 TAMPERE CONVENTION: MITIGATING DISASTERS

Satellite capabilities have long been recognized as very suitable for use in aspects of telecommunications for disaster relief and mitigation (TDR). The increasing versatility of satellite terminals and capabilities has made this technology very attractive as a means of providing communications for TDR situations. However, in the recent past it has been noted that whilst the physical logistics of deploying satellite technology have been improved and minimized,
regulatory barriers have not been as easy to overcome or mitigate.

The development of the Tampere Convention has been beneficial in identifying the scope of the problem and in proposing ways and means by which these might be overcome. The Tampere Convention effectively explores the overall concepts of the provision of additional telecommunication infrastructure to a disaster area. Whilst emphasizing the rights of national Authorities to control their own telecommunications environment, it suggests ways and means by which the provision of additional equipment might be facilitated.

In any disaster situation, it would therefore be beneficial to consider invoking the Tampere Agreement to facilitate and expedite the provision of satellite and other telecommunications services in support of disaster relief and mitigation efforts.

**Key elements of the Tampere Convention**

* The Convention is designed to expedite and facilitate the use of emergency telecommunications within the framework of international humanitarian assistance. Such telecommunication assistance can be provided as direct assistance, provided to national institutions and/or a location or region affected by a disaster, and/or as part or in support of other disaster mitigation and relief activities.

* The Convention defines the status of the personnel of the various partners in international humanitarian assistance, including that of government entities, international organizations, non-governmental organizations and other non-state entities, and defines their privileges and immunities.

* The Convention fully protects the interests of the States requesting and receiving assistance. The host government retains the right to supervise the assistance.

* The Convention foresees the establishment of bilateral agreements between the provider(s) of assistance and the State requesting/receiving such assistance.

A State may express its consent to be bound by the convention by any of the following means:

a) By definitive signature;

b) By signature subject to ratification, acceptance or approval followed by deposit of an instrument of ratification, acceptance or approval;

c) By deposit of an instrument of accession.

The period for signature subject to ratification, acceptance or approval (only) ended on 21 June 2003, by when 60 States had used this possibility either during the conference (ICET-98), which adopted the Convention in 1998 or during the past five years. Twenty-three States have during this period already deposited the instrument of ratification, acceptance or approval. There is no time limit for ratification, acceptance or approval with or without previous (provisional) signature, and it can be expected that the additional seven parties needed for its formal entry into force will join the Convention in the near future.

While the Convention is already widely applied and provides the framework for agreement on satellite and other telecommunications matters in most operations of international humanitarian operations, it is of course desirable that the number of 30 parties to the Convention be reached as soon as possible.

The United Nations Secretary-General is the Depositary of the Convention. The Office of Legal Affairs, Treaty Section, United Nations Headquarters, is in charge of the relevant procedures and information on depository matters (signature, ratification, acceptance, approval or accession). The United Nations Emergency Relief Coordinator and Under-Secretary-General for Humanitarian Affairs is the Operational Coordinator for the application of the Convention. The United Nations Office for the Coordination of Humanitarian Affairs (OCHA), Geneva Office, is in charge of the implementation and execution of the respective functions and works closely with the ITU.
Toward National and Regional Strategies in the Africa Context

Section 6
Toward National and Regional Strategies in the African Context

6. TOWARD NATIONAL AND REGIONAL STRATEGIES IN THE AFRICAN CONTEXT

Not surprisingly – and not unlike other large regions of the world - the African continent’s tremendous size and diversity have given rise to many different satellite regulatory and policy approaches. This, in turn, has contributed to the emergence of an important trend: Sub-regional groups of African Administrations have formed organisations that are helping to advance satellite-regulatory harmonisation initiatives.

From TRASA in sub-Saharan Africa to WATRA in West Africa to EARPTO in East Africa, these organisations have all been established to enhance Administrations’ efforts to achieve national policy objectives, but in a broader, more inclusive regional context. Satellite-based solutions are increasingly seen by these groups to be inherently well suited to helping achieve key African policy objectives – including improved standards of education, health, public safety and trade – not only at the national level, but also in a regional context.

The Administrations’ shared interest in collaborating on regulatory harmonisation is driven by recognition of two key factors:

1. Satellite-based services are able to quickly and cost-effectively provide Internet, data, voice, fax and video services in rural, suburban and urban areas, and for domestic as well as international applications;
2. To take advantage of satellite networks’ unique ability to provide links across the sub-regions – and across the various regulatory approaches applied in each nation – harmonisation is required.

Recognition of the former has also driven the tremendous national-level regulatory progress examined in the previous section of this Report. But are reforms having any practical impact in promoting expanded access to telecommunications? According to research by DTT Consulting\(^\text{156}\), in 1998 Africa accounted for less than 10 percent of the world satellite market for ISP links – the fourth lowest region in the world. Two years later – and during a period that corresponded with significant liberalisation of Africa’s VSAT sector - no less than 47 percent of African ISPs, respectively, were linked via satellite. Only Latin America - with 66 percent – was higher.

Certainly, much regulatory work remains to be done. But the successful results already realised from national-level deregulation of the satellite sector has set the stage for more concerted action at Africa’s sub-regional levels.

6.1 REGIONAL TRADE, REGIONAL ECONOMY, REGIONAL POLICY

Addressing the regulatory challenge of facilitating domestic and international satellite communications services is taking place today at the regional and sub-regional levels through groups of Administrations that share similar objectives. This trend, while not yet universal, is nonetheless apparent in both advanced and emerging regions, and involving both developed and developing countries.

From nation to nation and from region to region, there are numerous differences in the way Administrations are addressing the challenge. But there are also striking similarities and patterns that have become manifest in the way that successful harmonisation programmes are being applied\(^\text{157}\):

1. The first most fundamental similarity is the understanding among Administrations that if the regulatory environment for satellite communications is not optimised, the private sector’s ability to provide vital services and infrastructure is undermined or prevented;
2. The second is the agreement among Administrations within a given region that the solution is light-touch regulation underpinned by harmonised regimes that promote the cost-effective usage of satellite solutions;
3. Respecting the sovereignty of individual nations is generally regarded to be of paramount importance in any regional satellite regulatory harmonisation effort;
4. The next step is typically to create a public platform where access to each Administration’s satellite regulations is provided. This step, for which the Internet and the worldwide web is ideally suited, provides:
   • Nearly immediate, inexpensive transparency to facilitate the private sector’s provision of services, while relieving regulators’ administrative burden;
   • A means by which the regional intergovernmental group, usually through a task force or working group, can view the satellite regulations currently applied in their region, analyse them and thus develop improved harmonization through improved understanding of where their respective differences and similarities reside.
5) Harmonisation is usually (or always) pursued by establishing a body of satellite-related policy and regulatory principles that Administrations within the region mutually agree to be in their common interest;
6) These principles – which can take the form of Resolutions, Recommendations, Decisions, etc. - are typically non-binding and are meant to serve as regional-level guidance for national-level development and implementation of light-touch satellite

\(^{156}\) DTT Consulting is a U.K.-based consultancy specialising on satellite communications. See http://www.spotbeam.com

\(^{157}\) See http://www.itu.int, ITU Question 17-1: “Satellite regulation in developing countries”.

\(^{158}\) TRASA Members that have strategically liberalised the provision of VSAT services include: Angola; Botswana; Democratic Republic of Congo; Lesotho; Malawi; Mauritius; Mozambique; Seychelles; Swaziland; Tanzania; and Zambia.

\(^{159}\) See http://www.itu.int, ITU Question 17-1: “Satellite regulation in developing countries”.

\(^{160}\) GVF Satellite Regulatory Survey.
regulations.

7) Once adopted at the regional level, these principles then effectively serve as a template that, if implemented at the national level by various Administrations, promulges a progressively more harmonised regional operating environment.

6.2 TRASA: SOUTHERN AFRICA: 14 ADMINISTRATIONS, ONE REGION

During the past seven years, most of the southern African Administrations have been actively engaged in satellite regulatory reform at the national level. For example most of the countries in the sub-region have now effectively removed the major barriers to entry for foreign VSAT operators: there are typically no requirements to install a local hub; and license fee levels have begun to be lowered in most cases.

While Administrations in the region have not yet harmonised their satellite regulatory approaches, a proliferation of satellite-based services are now being offered in the region, including tele-medicine, distance learning, rural communications, PSTN backhaul for terrestrial mobile services in remote areas, and domestic and international corporate enterprise applications such as Internet service provision, retail, banking, oil & gas, and mining.

In parallel with this, the Administrations of the Southern African Development Community (SADC) formed the Telecommunications Regulatory Association of Southern Africa (TRASA) to coordinate regarding harmonised policy and regulatory principles that promote access to communications.

Harmonisation is viewed with suspicion by Administrations in every world region, because of concerns that it could infringe on national sovereignty. TRASA’s Members have successfully addressed those concerns whilst promoting harmonisation by developing model policies and regulatory frameworks. Each state is entitled to use TRASA guidelines and models at their own discretion. However, the presence of TRASA has encouraged its Member States to adopt the proposals and implement national policies in line with SADC’s goal of harmonisation throughout the region.

The TRASA Administrations’ harmonisation deliverables - which have included guidelines on everything from interconnection to accounting - are submitted as recommendations to the Southern African Transport and Communications Commission (SATCC), the organisation responsible for transport and communication matters in the SADC region. SATCC then submits these for ratification by SADC, after which the recommendations are made available for Member States to consider in the development of their own telecommunications policies and regulations.

Recently, the organisation has begun to focus on harmonising satellite regulation and policy in the region. This became apparent on March 2004 in Lesotho at a TRASA/CATIA Low-Cost VSAT Workshop, which resulted in the establishment of a detailed action plan targeting seven key areas:

1. **One-Stop-Shop Satellite Licensing:** The initiative, which is to include the creation of a harmonised VSAT-license form and a common online-application capability, is to be implemented first on each regulator’s website, with links to these placed on the TRASA web site.

2. **‘Open Skies’ Policies:** Recognising that some Administrations still have policies in place that prevent the free use of ITU-coordinated satellite capacity (generally, in these countries it is a requirement that satellite capacity is obtained from the incumbent operator, Inmarsat or, in some cases, New Skies Satellites) the TRASA Members agreed that:
   - The incumbent should have a right of first refusal;
   - Other factors beyond the regulator’s control may inhibit implementation of an ‘Open Skies’ policy; and
   - TRASA should identify all factors influencing the adoption of Open Skies policies.

3. **Harmonised Spectrum Fees:** Noting that some Administrations are already reviewing fee levels (and trying to get incumbent operators to release unused spectrum), the group will conduct a review that takes the following factors into account:
   - Spectrum fees are a source of revenue for some regulators, thus any reductions would have to be supported by alternative sources of funding;
   - In some Administrations, the practice of charging fees both per terminal and for spectrum usage has been simplified by implementing single-charge schemes;
   - A document detailing Administrations’ fee structures – as well as the rationale behind the fees – is to be compiled before attempts are made to recommend a standard regional approach; and
   - Fee changes would have to be supported by other reforms.

4. **Earth Station Licensing:** TRASA has begun a process of identifying the types of VSATs that could be covered by a blanket-licensing regime. The GVF “Regulatory & Policy Guidelines” are being used as a reference document.

5. **Appropriate License Fees:** The Administrations expect this area to be more difficult than any other. Again, noting that


162 See http://www.trasa.org

163 The WATRA Members include: Burkina Faso, Cape Verde, Cote d’Ivoire, Guinea, Guinea Bissau, Mauritania, Mali, Niger, Senegal, Togo, Republic of Benin, Ghana, Gambia, Liberia, Sierra Leone and Nigeria. For more information, contact Ms. Lolia S. Emakpore, emakpore@ncc.gov, tel. +234 9 670 3843/434 9 234 0330 Ext. 1098)

164 WATRA has since signed a CATIA MOU and began co-ordinating satellite regulatory harmonisation activities during a workshop held at WATRA’s Annual General Meeting held in Abuja during May 2004.

165 As reported in the October 2003 edition of SatMagazine.com.
fees are a source of revenue for some regulators – and/or the government – TRASA plans to evaluate all available options and identify an appropriate model for the region.

6. **Enforcement:** It was observed that frequencies are sometimes used without obtaining permission. Thus, self-regulation may be deemed unacceptable in some countries, where VSAT licensing approaches have been put in place to give some country regulators the means to take action against illegal spectrum use. Potential solutions are to be examined.

7. **Type Approvals:** It was agreed in principle that type approval certificates from other sources could be accepted. TRASA plans to:
   a. Define a minimum set of criteria;
   b. Establish a list of sources that meet those criteria;
   c. Consider whether type approval certificates should be supported by test results;
   d. Review the GVF Mutual Recognition Agreement and consider using a modified version acceptable to TRASA members.

As this Report was being drafted, TRASA had delegated responsibility for the above-noted priorities to several working groups and established a calendar of follow-up actions, starting with a meeting in Mozambique in May 2004.

6.3 **WATRA: THE WEST AFRICAN ‘HUB’**

The first Annual General Meeting of the West African Telecommunication Regulators Association (WATRA) was held in March 2003 in Abuja, Nigeria, where 16 Administrations gathered to launch the inter-governmental organisation that, amongst other key targets, aims to promote harmonisation of telecommunications regulation throughout the region.

A primary motivation for the new organisation – which is part of the inter-governmental body, the Economic Community of West African States (ECOWAS) family – is to facilitate trade within the region, as well as position West Africa as a hub for international commerce.

As an indication of the role envisaged by WATRA for satellite communications in the region, the Association hosted a two-day VSAT Regulatory Seminar during its AGM. During the course of open-forum discussion, a number of national regulators from across the region indicated their interest in facilitating both domestic and international satellite service provision through the mechanism of regulatory reform.

The tone for the meeting was outlined by WATRA’s then newly-elected Chair, Engineer Ernest Ndukwe, who also serves as Executive Vice Chairman of the Nigerian Communications Commission (see the Nigeria case study above). Addressing regulatory officials from most of the West African Administrations, Mr. Ndukwe cited VSAT-based services as being inherently well suited to addressing telecommunications requirements in the region. He added that WATRA had an excellent opportunity to facilitate expanded access to telecommunications, by, for example, enabling services transmitted via a hub in any West African country to be offered in any other nation in the region.

A variety of reports on related initiatives were presented at the meeting:

* Following the February 2001 launch of a study on “Policy Harmonisation in the Telecommunications Sector of the Economic Community of West African States”, it was recognised that there was a need to harmonise telecommunications policies within West Africa, because of the pivotal role of the sector in economic development. In a report that addressed the issue of the region’s vision of becoming a preferred investment destination, it was identified that regulators should undertake a number of clearly defined roles. These included: Implementation of government policies (in their respective countries); acting as advisers to government in the development of telecommunications or ICT policy matters; and regulating and facilitating competition and service delivery in their respective jurisdictions. The report concluded by emphasising that it was essential that WATRA take the initiative and provide leadership in future regulatory harmonisation processes across the sub-region.

* In 2001, ECOWAS took the decision to establish a regional telecommunications database within the framework of its INTELCOM II telecommunications priority programme. The central objectives of the ECOWAS Telecommunications Information Management System (SIGTEL) were: Monitor the implementation of the regional information and communications infrastructure; store key data on the West Africa communications sector; and provide users with accurate information on the telecommunications sector. The database is now being implemented with support from the ITU and is expected to be operational by mid 2005.

Given the declared emphasis on the necessity of WATRA taking the lead role in the drive for regulatory harmonisation across the sub-region, of significance is the fact that the data-
workshop, where participants reached an initiative was generated during the Mombassa of telecom licenses. An initial report has be given strategic priority among other types that VSAT network solutions would potentially regional VSAT-based services, which is to say is exploring a potential agreement involving tions in East Africa. In particular, the Task Force opportunities to harmonise telecom regula- regulators and which is currently identifying Force had been created, involving representa- tives of the Commonwealth Telecommunicati- on Organisation (CTO) and the GVF, the joint- ly by the Commonwealth Telecommunication Organisa- tion (EARPTO) and included nearly 40 delegates to strengthen the dialogue on satel- lite communications interface between the SIGTEL database server and the various member states’ corre- spondents employs satellite technology.

And each regulator will also have tools nec- essary for automatic data collection and shar- ing. It is worthy of note that the telecommuni- cations interface between the SIGTEL database server and the various member states’ corre- spondents employs satellite technology.

6.4 EARPTO: THE REGIONAL-LICENSING OPPORTUNITY

The map of East Africa – including most nota- bly Kenya, Tanzania and Uganda - may soon be redrawn to portray a single satellite market. The Administrations of each East African coun- try are currently exploring the possibility of implementing a regional approach to satellite regula- tion that would facilitate the provision of cross-border services.

While East African regulators have been mulling the opportunity for several months, focused attention was given to the prospect during an Internet and VSAT Policy Workshop held on 25-26 September 2003 in Mombasa, Kenya, where public- and private-sector deleg- ates met to strengthen the dialogue on satel- lite regulatory reform in the region. Organised jointly by the Commonwealth Telecommunica- tions Organisation (CTO) and the GVF, the event was held for the East Africa Regulatory Postal and Telecommunications Organisation (EARPTO) and included nearly 40 delegates from regulatory agencies, ministries, telcos and private satellite service providers from East Africa, and including Ethiopia.

During open-forum discussions, a repre- sentative of the Communications Commission of Kenya reported that a special EARPTO Task Force had been created, involving representa- tives of the Kenyan, Tanzanian and Ugandan regulators and which is currently identifying opportunities to harmonise telecom regula- tions in East Africa. In particular, the Task Force is exploring a potential agreement involving the provision of “preferential licensing” for regional VSAT-based services, which is to say that VSAT network solutions would potentially be given strategic priority among other types of telecom licenses. An initial report has al- ready been drafted, and Task Force follow-up is underway.

Broader interest in and support for the ini- tiative was generated during the Mombassa workshop, where participants reached an in- formal agreement that harmonisation of telecom regulation in East Africa can and should be implemented in order to facilitate expanded access to communications in the region, as well as to stimulate trade. Further, it was informally agreed that provision of VSAT services – both domestic and international - could be encouraged by the harmonisation ef- fort. The effort is strengthened by the fact that, until a few years ago, the three nations did not apply international charges for calls between them, and in so doing, grew accustomed to permitting cross-border communications in East Africa. In addition, it was confirmed dur- ing open-forum discussions at the workshop that each regulatory Administration – Kenya, Tanzania and Uganda – has already begun de- regulating its respective satellite service sec- tors. For example:

• The Tanzania Communications Commis- sion delegate noted that his administration liberalised its telecom market in 1994, be- gan licensing ISPs in 1998 and thereafter liberalised 4-5 VSAT services, including public data networks and international data. The Administration is currently con- sidering the possibility of liberalising in- ternational voice services on 21/2/05.

• The Uganda Communications Commission representative noted that before 1993 there was an incumbent monopoly, but that in 1996 the first ISPs were licensed. Currently, basic telephony via satellite is provided exclusively by two licensees, but this exclusivity ends in 2005, and a review will be conducted soon relating to deregu- lation of VSAT services.

• And the Communications Commission of Kenya regulator noted three VSAT license categories in their country:
  - Private VSAT network operator, which is fully liberalised, with a two-year li- cense period;
  - National commercial VSAT network op- erators, which are partially liberalised with a 15-year license period;
  - International commercial VSAT network operators, which is a monopoly of the incumbent up to June 2004.

While common ground was identified dur- ing the workshop, it also became clear that the Administrations face challenges. The group found that they shared experiences in common with regard to a number of telecom regulatory issues that relate to satellite communications. These included:

• **VoIP:** These services are in great demand, and in some cases they are being provided via satellite, even though the provider may not be licensed to provide voice services. A discussion ensued regarding conver- gence and the growing difficulty in distin- guishing between voice and data services, as IP-based services become increasingly prevalent.

• **Enforcement:** The difficulty of enforcing compliance with regulations that restrict service providers from providing VoIP and other services was noted by both the private- and public-sector delegates.

• **Technology Neutrality:** During the dis- cussions, it became apparent that some regulators want to license telecoms based upon the “platform” (or technology), while others said their administration pre- fers to license telecoms based upon serv- ice categories.

• **GMPCS:** The regulators noted that greater education was needed regarding the im- plications of the GMPCS-MoU on VSAT- based systems and services.

As the Administrations continue to seek regulatory approaches that facilitate provision of regional satellite services, they – as well as their counterparts in other African sub-regions – may augment their efforts through the CATIA project. It was suggested during the workshop that the programme could serve as a catalyst for EARPTO, and the questionnaire for the IDRC Pan-Africa Satellite Survey was distrib- uted and filled in by the Administration offi- cials, who expressed interest in participating in the new programme.

Addressing the regulatory challenge of facilitating domestic and international satellite communications services is taking place today at the regional and sub- regional levels through groups of Administrations that share similar objectives. This trend, while not yet universal, is nonetheless apparent in both advanced and emerging regions, and involving both developed and developing countries.
Where to From Here?
Mapping the Future of Satellite Regulation in Africa
Where to From Here?

Mapping the Future of Satellite Regulation in Africa

7. WHERE TO FROM HERE? MAPPING THE FUTURE OF SATELLITE REGULATION IN AFRICA

The Pan-Africa Satellite Survey conducted for this report – as well as related work undertaken by the ITU and GVF – demonstrate that most African Administrations now recognize the value of satellite-based telecommunications solutions in expanding access to ICTs. More than this, the surveys show that, while restrictive satellite regulation and policy remains a major hurdle in Africa, most Administrations have begun to address the challenge, and they have begun doing so in co-ordination with neighboring Administrations.

The surveys also suggest possibilities for Africa’s future. Harmonisation of satellite regulation and policy throughout the Continent is clearly achievable – and tangible benefits could be realised quickly - but it will not be easy, and will require a commitment by the leadership in Administrations to drive the process, to make it happen. This, at least, has been the experience of Administrations in other regions, whose efforts to achieve satellite-regulatory harmonisation are examined in this section.

In particular, a focus has been applied to programmes implemented in Europe and the Americas. While the contexts of each region differ in many ways from Africa, there are also fundamental similarities: The motivation for their harmonisation programmes has been driven first by national self interest, and this interest is largely economic. More robust trade, new jobs, a stronger tax base, increased investment, and so on.

While most if not all European and Americas Administrations want harmonisation at some level, national sovereignty is just as important to them as it is to African Administrations. The way that Administrations in both regions have balanced those two priorities may differ – of other regions in matters relating to satellite regulatory and policy reform, African Administrations have an opportunity to tailor local solutions that draw selectively upon relevant approaches applied elsewhere and thereby participate in what may best be described as a leapfrog effect.

7.1 THE EUROPEAN EXPERIENCE: HARMONISING 46 REGULATORY REGIMES

The association of European Post and Telecommunication Ministries, CEPT, has played an important role in promoting harmonization across their region. CEPT Administrations cooperate, in close consultation with their industries, to produce regulatory frameworks that are conducive to the promotion of the European communications industries while giving a fair deal to consumers.

The binding nature of European Community Regulations and Directives makes the drafting of such measures a relatively slow, painstaking business. In contrast, the Decisions and Recommendations of the CEPT can be developed more quickly, not because less care is taken, but because Administrations that have no intention of “volunteering” to implement them need not go to great lengths to block their adoption. In practice, it has been found to be the case that some Administrations do not adopt CEPT measures formally, but in point of fact do allow their implementation in their jurisdictions, and are comfortable with that arrangement.

The European One Stop Shop (OSS) and the ‘COM’

The European Commission mandated the CEPT to come up with workable OSS arrangements and agreed to fund the project. A database was designed and built, now housed and operated in the European Radiocommunications Office (ERO) in Copenhagen, with full Internet capability. The OSS – which is located in the “OSS Satellite” section of the web site – has two main elements: a) a database of information about authorisation/licensing requirements and procedures in participating CEPT countries; and b) an electronic “Combined Application Form” containing all the questions asked by participating CEPT Administrations pursuant to granting licences.

The OSS is designed to enable an applicant for licences in, say, five European countries to call up the Combined Application Form on the Web, select the countries concerned and the type of licences required and the software would sift through the questions and present only the relevant ones to the applicant. He/she completes the form and presses “send”. The Shop (the ERO’s licensing expert) checks the form and forwards it to the countries concerned. The really clever part is that the receiving licensor sees only the questions and answers that are relevant in that country.

This compares with the traditional approach whereby the applicant fills in the different forms of each different country, all asking different things in different ways and spending ages trying to find out what is required in each jurisdiction. In addition to managing the OSS Shop, ERO is actively promoting implementation in all CEPT countries. At the moment applications can be filed via the Shop for: Austria, Belgium, Denmark, Finland, France, Ireland, Luxembourg, Monaco, the Netherlands, Norway, Portugal, the Netherlands, Norway, Switzerland and United Kingdom. ERO expects more countries to join the OSS scheme in the near future.

It should be noted that the Combined Application Form was always seen as just a stepping-stone in the harmonisation process. Before the paint was dry, the CEPT began looking for something simpler and more effective, a truly common application form. A CEPT Project Team set about examining carefully all the questions in the Combined Application Form to see if it was possible to condense them into a single form that could be acceptable to all. It was. The number of questions dropped from around 130 to around 30. The resulting Common Application Form (COM) – a reduced set of licensing authorisation conditions - has now been adopted as a CEPT Recommendation and is suitable for use in CEPT countries that continue to require individual licensing and in the regimes that have implemented the “Framework Directive” with the emphasis on General Authorisations.

The OSS, while it was ultimately success-
However, countries without Internet facilities high number of the European countries did not the most common web browsers, a surprisingly Although the OSS was designed to be used with Many Administrations do not have the be better to go to Denmark direct. questions and, in the circumstances, it would from the ERO, and Denmark asks a handful of cally but will accept a copy through the post accept the CAF, France only accepts it for VSAT plications. For example, an applicant looking the case as long as the bulk of CEPT Adminis- they would use The Shop if it were advanta- geous for them to do so, but this will not be the case as long as the bulk of CEPT Adminis- trations will only accept individual paper ap- plications. For example, an applicant looking for licences in Germany, France, UK and Den- mark (all EU) may be tempted to use The Shop. But they would find that Germany does not accept the CAF, France only accepts it for VSAT and SNG, the UK does not accept it electroni- cally but will accept a copy through the post from the ERO, and Denmark asks a handful of questions and, in the circumstances, it would be better to go to Denmark direct.

Many Administrations do not have the right software.

Although the OSS was designed to be used with the most common web browsers, a surprisingly high number of the European countries did not have sufficient connectivity to use it effectively. However, countries without Internet facilities are still able to participate. They are able to receive the forms from the ERO through the post. Although this may seem self-defeating, it still allows the applicants to apply using just one electronic form thus reducing the burden on the applicant - which was the idea.

Acceptance of electronic signatures.

Some Administrations in this position are accepting applications electronically, but a signed document is sent direct for the applicant to the Licensor.

Exemption from Licensing of Satellite Terminals and Free Circulation Decisions

From the beginning of the 1990s, the CEPT was working on measures designed to simplify pro- cedures for moving satellite terminals across country borders and using them without the need for individual licences. The CEPT developed a policy for licence exemption for terminals that were type approved to a certain standard and operating within identified frequency bands. In parallel, a series of “Free Circula- tion” decisions for terminals permit the “tem- porary import” and use of identified terminals. This is an example of the double benefit of re- ducing burdens on industry – and doing the same thing for customers.

All 46 European nations have now adopted a set of non-binding policy principles that eliminates the need for individual licensing of receive-only and interactive VSAT terminals, as well as a wide range of mobile terminals²⁶. Called “Decisions”, the policy principles have begun to be implemented by individual na- tional Administrations since 2000. The Deci- sions exempt VSATs or mobile handhelds from individual terminal licensing require- ments, provided that they meet specific technical criteria – such as frequency use, maximum radio power, etc. - that assure adherence to recognised safety standards. Stations that meet these requirements can quickly and easily be put under a general “blanket” type of license. In this case no or minimal administration is necessary and there is no need to require a licence prior to operating the terminal. These exemptions and blanket-licensing policy principles are divided into the following adopted ‘Deci- sions’:

* Receive-Only Earth Stations (“ROES” De- cision): Almost 90% of European countries have adopted this principle;
* Exclusive Ku-band VSATs (“VSAT” 2000 Decision), which have now been imple- mented by 15 countries;
* Several Decisions for mobile terminals, which have been implemented by cer- tain countries;
* Ka-band Interactive Earth Stations (“SIT” and “SUT” Decisions), which have been implemented by 17 and 18 countries, re- spectively.

There are key advantages in having such generic Decisions, both for the CEPT and also for satellite operators, since one Deci- sion can cover multiple technically-compara- rable antenna and terminal types. This not only enables rapid network deployments across the region, but facilitates harmonisa- tion of VSAT licensing fees. For example, Charts 12 and 13 serve as a before-and-after snapshot of VSAT licensing fees in Europe. Chart 12 shows the results of a case study conducted in 2000, when first-year licens- ing fees in selected European countries were

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165 See http://www.ito.int, ITU Question 17- 1: “Satellite regulation in developing countries”.
166 This sub-section derives from a contribu- tion made by Michael Leach, Manager, Inter- national Satellite Policy and Regulation, U.K. Department of Trade & Industry, who also led the CEPT working group responsible for establishing the “COM”, Europe’s reduced and harmonised set of satellite service licensing authorisation conditions. An expanded version of the contribution also appears in ITU Question 17-1: “Satel- lite regulation in developing countries”. See also this Report’s Sources & Resources for further details.
167 Non-Treaty Intergovernmental Organisation comprising the post and telecommu- nications Ministries of 46 European States. http://www.eto.dk
168 Mike Leach Chaired CAF-R, which was tasked with designing a Common Application Form using the Combined Application Form as a starting point.
examined, assuming a VSAT network with the following characteristics:

* A bi-directional 64 Kbps link & using 200kHz – 1MHz of bandwidth;
* A network of 10 earth stations and one hub all located within a single country;
* Supporting a data service, and using a single satellite;
* With connection to the PSTN, and not requiring co-ordination.

In 2000, first-year licensing fees across a range of 11 European administrations exhibited significant differences. But immediately before, during and after the 2000 case study was conducted, the CEPT Administrations had begun adopting the new satellite Decisions, which had a direct bearing on receive-only and bi-directional FSS systems’ license fees. From receive-only earth stations (“ROES”) to Ku- and Ka-band two-way systems (“VSATs”, “SITs”, and “SUTs”), in each case they reduced unnecessary licensing and, in so doing, minimised the fees associated with them.

By 2002, the majority of CEPT Administrations had implemented a high percentage of satellite-related Decisions. As implementation of the satellite Decisions progressed, it helped to establish a more harmonised VSAT licensing fee structure across the region, as can be seen in Chart 13.

**Lessons Learned**

The lessons learned in Europe were expensive lessons perhaps, but they were worth it. Perhaps the most important piece of information that gathered is that being too sensitive about sovereignty and unwilling to enter compacts built on trust, ultimately, makes everyone the loser. By contrast, reaching out to neighbours and working together by pooling knowledge has helped to produce a marketplace in which goods and services can be bought and sold efficiently and, just as importantly, an environment in which cultural understanding has grown.

**Chart 13: VSAT Licensing Fees, 2002 (150kHz)**

- **Denmark**: 7.000 Euros
- **Estonia**: 1500 Euros
- **Spain**: 360 Euros
- **Sweden**: 390 Euros
- **Belgium**: 353 Euros
- **Poland**: 379 Euros
- **Netherlands**: 373 Euros
- **Ireland**: 350 Euros
- **Norway**: 275 Euros
- **Germany**: 390 Euros
- **Hungary**: 463 Euros
- **Belgium**: 970 Euros
- **UK**: 684 Euros
- **Finland**: 600 Euros
- **France**: 324 Euros
- **Portugal**: 379 Euros
- **UK**: 274 Euros
- **Italy**: 299 Euros
- **Lithuania**: 280 Euros
- **Croatia**: 280 Euros
- **Slovenia**: 296 Euros
- **Lithuania**: 304 Euros
- **Slovenia**: 325 Euros
- **Croatia**: 363 Euros
- **Lithuania**: 379 Euros
- **Slovenia**: 465 Euros
- **Croatia**: 484 Euros
- **Lithuania**: 1040 Euros
- **Slovenia**: 1521 Euros
- **Croatia**: 279 Euros

7.2 CITEL: HARMONISING SATELLITE REGULATIONS IN THE AMERICAS

The issue of granting licenses for satellite networks has been an item of key importance in the regulations of the countries in the Americas hemisphere. With regard to the current status of satellite regulations of CITEL member governments, the Third Summit of the Americas held in Quebec, Canada in April 2001 requested that Ministries or departments responsible for telecommunications and appropriate regulatory bodies cooperate, within CITEL, in order to clarify and simplify rules governing the provision of satellite services in the countries.

As for regulations governing satellite systems and cooperation to meet the requirements in each country to obtain licenses to provide satellite telecommunications services, progress has been made in a variety of areas. Because of the interest in the subject, and with the participation of governments, CITEL’s “Permanent Consultative Committee II: Radio communications including Broadcasting (PCC.II) Working Group Relative to Satellite Systems to provide Fixed and Mobile Services” has prepared a web page on CITEL’s website with information on contact persons in regulatory agencies; frequency bands available to VSAT networks, requirements for frequency coordination; temporal policies; policies on receive-only terminals; and, registration forms. Access to the information is available for 20 administrations so far.

Common areas and differences can be identified among the requirements in the existing regulations of various CITEL member Administrations, and also varying levels of development of such regulations for granting satellite network licenses in member countries. In granting licenses, Regulators in the region of the Americas share certain fundamental objectives related to regulatory policies, such as:

* Regulators seek to implement simplified, harmonized regulatory policies that will promote investment and deployment of satellite systems (VSAT, broadband, etc.), and that improve public interests, the economy and well-being of countries;
* Regulators grant licenses to earth stations and try to ensure that licensees and users are protected from detrimental interference.

In the context of CITEL, the Working Group Relative to Satellite Systems to provide Fixed and Mobile Services has also begun to discuss the concept of OSS (One-Stop-Shop), following the experience in Europe. As part of its studies, CITEL is still seeking to determine which is the most appropriate forum for the OSS concept, the manner in which information is to be updated, and possible financing arrangements.

The first meeting of PCC.II in Orlando, Florida adopted resolution PCC.II/RES.1(03) establishing CITEL’s electronic forum, a discussion group to prepare proposed guidelines for
implementation of regulatory measures to promote the deployment of broadband satellite networks in the Americas.

During the second meeting of PCC.II held in San Salvador in October 2003, the comments and proposals of the discussion group were examined and a report comprising satellite experts in the sector and regulators. The objective was to encourage the development of adequate, flexible regulatory systems that will permit rapid implementation and use of, and access to, the services provided through the satellite systems, with an emphasis on broadband networks, as part of the technologically, economic, and social development of CITEL member countries. Based on the results of the round-table discussions, the Working Group Relative to Satellite Systems to provide Fixed and Mobile Services drew up the “Guidelines for the implementation of national regulations that facilitate the deployment of satellite services, particularly broadband services, in the Americas.” These guidelines were approved by PCC.II under CITEL recommendation PCC.II/REC.6 (II-03) to the effect that, among other things, the Member States’ ministries or departments responsible for telecommunications and appropriate regulatory bodies should consider the possibility of including in their national regulations concepts associated with: “block” or “generic” earth station licensing; regional or international hub requirements; availability of procedures, regulations and applications online; minimisation of regulatory requirements for landing rights; minimisation of local presence requirements; consumer protection; development of additional means of promoting satellite broadband deployment; and dissemination of the CITEL Mutual Recognition Agreement aimed at eliminating the duplication of the homologation and certification processes in Member States (see annex for details on Recommendation PCC.II/REC.6 (II-03) as adopted by the Member States).

As regards global mobile personal communications systems (GMPCS), CITEL acknowledged the GMPCS Memorandum of Understanding and recommended that its Member States consider the expediency of initiating arrangements at the national level to permit the unrestricted circulation of GMPCS terminals across their borders (recommendations PCC.II/REC.49 (XI-99) and PCC.III/REC.56 (XIV-99)).

Another subject of importance to CITEL is the Tampere Convention, which seeks to make it easier for aid and rescue workers to ensure the cross-border transportation of telecommunication equipment during and after an emergency and to use that equipment under secure conditions within the framework of international humanitarian assistance. The Member States have therefore been urged to sign and ratify the Tampere Convention to facilitate its entry into force (resolution COM/CITEL 169 (XIII-03)).

7.3 CATIA: SUPPORTING THE DEVELOPMENT OF SATELLITE REGULATION IN AFRICA

Progress on opening competition in Africa’s broadcast, telecoms and Internet fields has been slow compared to other continents. Over the last 10 years considerable resources have been focused on trying to make it happen more quickly, but lack of knowledge and short-term interests have made it difficult to create genuinely competitive environments.

Without increased competition, access costs have fallen more slowly and service delivery has not met demand. There have been few successful sustained attempts to offer widespread rural access. There are many already working on the task of creating competitive regulatory frameworks but all acknowledge that there is no “magic bullet” to achieve this objective.

Although there have been successes (e.g. the creation of independent regulators), the central issues of competition and regulatory reform have only begun to be addressed. In order to attract private sector capital into telecommunications infrastructure, there will need to be improved competition and regulatory regimes to allow new entrants into the field. Failure to provide this type of regime means that African countries will slip further behind in terms of global competitiveness. NEPAD’s programme of action has made these assumptions a significant part of its underlying rationale.

The approach being supported through the CATIA programme aims to support a wide range of local stakeholders who will in practice be the main drivers for a positive reform process; advancing reform from within, as an integral part of the development process.

An African One Stop Shop

The CATIA satellite project aims to provide support for African Administrations to adopt the emerging global standards and multi-country collaborative strategies in provision of regulations for low-cost satellite services. The lack of these are seen as amongst the most significant barriers limiting the rapid deployment of the new more affordable VSAT-based Internet services which could have a significant impact on improving access to the Internet in Africa. Thus, in the context of the GMPCS regulations for landing rights; minimisation of local presence requirements; consumer protection; development of additional means of promoting satellite broadband deployment; and dissemination of the CITEL Mutual Recognition Agreement aimed at eliminating the duplication of the homologation and certification processes in Member States (see annex for details on Recommendation PCC.II/REC.6 (II-03) as adopted by the Member States).

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form, which can be simultaneously submitted to all of the regulatory authorities chosen by VSAT operator.

3. **Regional satellite policy and regulatory guidelines** will be developed for southern Africa, based on the experiences of TRASA and drawing from the GVF’s “Satellite Policy and Regulatory Guidelines”.

4. **A One Stop Shop will be created for Southern Africa** following the first awareness workshop. Based on data the CATIA team and its partners have gathered and the inputs from national regulatory authorities, TRASA will maintain the sub-regional One Stop Shop for Southern Africa. It is envisaged that an integrated One Stop Shop for Africa would be created towards the end of the CATIA programme, by pulling together three sub-regional One Stop Shops, one each from TRASA, EARPTO and WATRA.

The main challenge for the project is to ensure that the goals of achieving blanket exemption and adoption of the OSS by national regulators (along with harmonised/reduced regulatory barriers) is quickly and universally adopted by the Administrations. The experience of the European OSS clearly underlines the importance of ensuring universal adoption of the system, otherwise the programme will falter.

Given that there is now a high priority by national governments and regional/sub-regional bodies to improve connectivity in Africa, there is a strong political imperative backing this initiative. This project aims to assist the regional regulatory associations to encourage standards and uniform compliance among members, and to ultimately operate the One Stop Shop.

It is possible that there may be some concerns at the national policy-making level in some countries over the loss of potential licensing revenues that may prevent them from adopting blanket exemptions. Thus, a key task of CATIA will be to develop proposed general strategies for revenue generation to ensure autonomy of the regulators. In general, the principle is that license-fee income from issuance of many small licences (not necessarily large bids for fixed line or GSM licenses) should be used to support the regulator, instead of larger fees derived from only a few service providers.

Finally, once the regulatory constraints are addressed, there are other challenges to widespread deployment of VSAT services, such as the lack of local technicians to install and support thousands of terminals, the need to provide equipment with alternative sources of power in rural locations, and the need to collect payments from remote rural areas in local currencies.

For technician training, a VSAT Installer Certification Course has begun to be rolled out by the GVF (see Sources & Resources). Alternative power sources are less easily addressed; the higher costs will have to be addressed through industry innovation, funded programmes, or both. And Africa’s rural-payment issues may be overcome by drawing on the experience developed with pre-paid scratch cards for GSM services.
Conclusions
Conclusions

8. CONCLUSIONS

Of the world’s 49 Least Developed Countries (LDCs) – defined by the UN as low-income countries suffering from long-term handicaps to growth – 31 are from the Africa region. The ITU has calculated that, until a country has passed the threshold of 1 main line per 100 inhabitants, it is “virtually impossible” to predict how long it will take to reach higher levels. Thirty-four of the 49 LDCs have a teledensity of less than one.

Providing increased access to ICTs in Africa is a complex problem. Access to the Internet and other telecom services has been held back not only by restrictive regulatory frameworks, but also antiquated infrastructure, high fixed costs, low economic and investment activity, diverse geography, language and culture, and much more. Accordingly, VSAT is not proposed to be the tool for Africa’s challenges; it is one of several tools, each of which plays to its respective strengths – fibre for point-to-point services, mobile for voice and narrowband data, satellite for point-to-multipoint narrow and broadband solutions.

In interviews, meetings, and workshops, in casual conversation and in public speeches, officials of African Administrations – including ministries, regulators, and incumbents – have expressed their frustration with the seeming intractability of the ICT-access problem. In a paper submitted to a recent communication conference, Akossi Akossi, Secretary General of the African Telecommunications Union (ATU) – and a former Director General of the Cote d’Ivoire Telecommunications Regulatory Agency (ATCI) – referred to the lack of ICT infrastructure throughout the Continent as, in a word, “cruel”.

The Pan-Africa Satellite Survey and case studies conducted for this Report have also demonstrated that an important tool has emerged that is capable of leveraging accelerated access to ICTs, provided that African Administrations are prepared to actively facilitate its use. In the satellite area, frequency use, network operations, service provision and the use of radio terminals can be considered as the main elements which have been the target of a number of regulatory measures (e.g. licensing conditions and procedures) normally meant to help the development of satellite telecommunications and facilitate market access to satellite providers, but which may also act as market barriers.

These are not the only challenges. From among the aforementioned technological innovations have arisen systems and services - most notably IP-based satellite communications – that require a rethink of traditional regulatory approaches. Domestic vs. international, telecommunications vs. broadcasting, voice vs. data... all such distinctions have been superseded by the advance of IP-based satellite, which effectively renders all services into one form: data.

At the same time, the industry’s competitive structure has also changed at the level of national and international markets: Many Post, Telegraph and Telephone organisations (PTTs) have been privatised as well as intergovernmental satellite operators. This concurrent evolution of satellite operators, service providers, and applications - as well as their corresponding regulatory treatment - highlights the importance of ensuring transparent and non-discriminatory market access conditions as the best means of promoting an individual country’s development. Like never before, and as stated in the definition of ITU-D Question 17/1, “Administrations must ensure that their regulatory treatment provides a level playing field for both existing and emerging satellite operators, service providers and satellite-based applications.”

Such treatment may be facilitated at various levels: Globally through organisations like the WTO and ITU; regionally through groups like the Asia Pacific Telecommunity (APT), African Telecommunications Union (ATU), European Conference of Postal and Telecommunications Administrations (CEPT), European Commission (EC), Inter-American Telecommunications Commission (CITEL); and sub-regionally through groups like EARPTO, TRASA, WATRA and others.

However, while these organisations are one of the ideal types of forum through which to pursue harmonisation, implementation of regulatory reform is largely being driven by initiatives taken at the national level. In summary, these reforms include:

* Establishing an Independent Regulator;
* Strategically Liberalising the VSAT Sector;
* Creating Transparency;
* Streamlining Licensing Conditions;
* Effectively Managing Spectrum;
* Optimising Certifications;
* Achieving Content Neutrality;
* Ensuring Compliance;
* Joining the WTO and Making Satellite Commitments;
* Implementing the GMPCS MoU Arrangements;

Liberalisation, transparency and a commitment to satellite regulatory harmonisation are within Africa’s reach. So too is Africa’s ability to transform the statistics.

176 From the ITU pamphlet on the Special Programme for the Least Developed Countries, 2000-2003.
177 Ibid.
180 Satcom Africa 2004, held on 17-18 February in Johannesburg, South Africa.
* Co-ordinating Satellite Services Using the ITU Radio Regulations;
* Mitigating Disasters Employing the Tampere Convention.

As has been shown in this Report, the above-noted practical steps have already begun to be taken in Africa, and with significant success. Nigeria’s liberalisation and reform of the sector resulted in rapid increases in investment, jobs, and access to ICTs for the entire spectrum of users: From the largest corporate enterprises, to schools and hospitals, to consumers. And theirs was not an isolated case: Malawi, Tanzania, Mozambique, Uganda, Mauritius - literally dozens of African Administrations have begun the process of facilitating satellite service provision.

This, however, is only the beginning of a story that is still being written. Of those African Administrations surveyed that had implemented satellite reforms, most were in relatively early stages and none had fully implemented all - or even a few - of the above-noted approaches. While this poses a major obstacle to addressing Africa’s “digital divide”, it also represents what may be one of the largest regional ICT opportunities in the world.

As African Administrations continue to develop satellite regulatory reforms – and the IDRC Pan-Africa Satellite Survey confirms this is underway right now - they are doing so in co-ordination with neighbouring Administrations, with whom they share not only a common border but also common policy objectives, including enforcement of radio frequency allocations and ensuring that licensees are protected against harmful interference. Increasingly, those shared policy goals have also come to include the provision of ICT solutions applied domestically and internationally or, more to the point, the promotion of public interest, social welfare and trade -to, from and within the region.

The regional regulatory authorities - EARPTO, TRASA and WATRA have each recognised the potential to develop an international and harmonised operating environment that embraces satellites’ inherent ability to provide end users with an inexpensive, single communications platform capable of serving almost any location, regardless of population density or proximity to urban areas.

Active participation by Africa’s inter-governmental groups is essential, because one of the greatest strengths of satellite networks also, nonetheless, creates the greatest regulatory challenge. Satellite operators depend on harmonised regulatory approaches, because of their wide coverage. The services that the operator provides, often on a pan-regional scale, depend on authorisations and spectrum allocations in each country in its coverage zone. If those authorisations are difficult to obtain or allocations are not uniformly recognised across a region, then the advantages of satellite services can be blocked.

To help overcome that challenge, the CATIA programme has been launched and is being engaged by Africa’s regional regulatory groups, as well as by the individual Administrations who are their Members and whose direct participation will decide the next chapter of this story. Those Administrations include, it should be noted, countries like Botswana, whose teledensity increased from 2.07 to 7.51 in the 1990s and was subsequently removed from the list of LDCs. They also include countries like Cape Verde, whose teledensity level increased from 2.41 to 11.21 in the 1990s and was recommended for graduation from the LDC list in 2000.

Liberalisation, transparency and a commitment to satellite regulatory harmonisation are within Africa’s reach. So too is Africa’s ability to transform the statistics.