Introductory text

This section includes information on licensing and the use of satellite-based Very Small Aperture Terminals (VSATs) for social and economic development in Africa. It has been prepared by the team working on a project called Catalysing Access to ICT in Africa (CATIA) and funded by the International Development Research Centre, the Department for International Development, and others working in this area.

The Project seeks to promote access to VSAT solutions through the development of a regional consensus and an information system that facilitates the implementation of effective satellite regulations. The Global VSAT Forum and is honoured to lead the satellite project and, together with support from our distinguished partners, is pleased to present for your reference the VSAT regulatory information contained in this section.

More information on CATIA

Research on the Application and Regulatory Framework of VSAT Technology in Africa

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Introduction

This overview summarises a programme of research on licensing and use of Very Small Aperture Terminals (VSATs) technology for social and economic development in Africa. It has been prepared by the team working on the Catalysing Access to ICT in Africa (CATIA) project of the Department for International Development (DFID) and is designed to support the work of CATIA, IDRC and others working in this area.

The Project seeks to expand the work of one of the components of the CATIA project. This component aims to work towards the elimination of the prohibition on private use of VSAT and develop regional consensus and an information system that supports blanket exemption and mutual recognition agreement type-approval for low-cost Ku/Ka band VSAT terminals for Internet access.

The project also forms part of the IDRC funded initiative Africa ICT policy research project coordinated by the LINK Centre. This project aims to promote studies that support continental and international initiatives to reduce the digital divide and that examine the broad nexus of social, economic, developmental and policy issues surrounding information and communications technologies, including ICT infrastructure development, policy and

regulation. The goal of the project is to contribute to IDRC's effort towards the creation of a repository of information for African policy makers, regulators, researchers and the media, and debate and innovative solutions to help increase wider access to ICT by the African population.

The programme builds on existing work in this area (e.g. the regulatory database of the Global VSAT Form) and fills important gaps in research and analysis. A systematic analysis of the current state of VSAT regulatory framework, end-users application, cost structure and technical issues is critical for wider understanding of the implication of wireless technology to social and economic development in Africa. This programme aims to carryout research on the application and regulatory framework of VSAT technology in Africa to fill the gap in understanding of current state of affairs of the technology and its future implication for social and economic development.

Project Objective

The objective of the project is to carryout research on licensing and use of VSATs technology for social and economic development in Africa in support to the CATIA project. The study will:

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

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

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

By surveying current use of VSAT technology and investigating policy issues, the project aims to develop strategies for potential application of VSAT technology to development issues facing Africa as identified by regional bodies such as the African Union and the New Partnership for Africa Development (NEPAD).

The Context

Africa's national social and economic development, its regional cooperation and integration and its participation in the global economy is increasingly linked to availability of the Internet to the population. Yet, only one in 150 people on the average can have access to the Internet. Access has been retarded by restrictive regulatory frameworks, antiquated infrastructure, high fixed cost and low economic and investment activity in Africa.

Currently a number of initiatives are underway to deal with some of these problems. The Acacia initiative of IDRC, the Connectivity Africa initiative being managed by IDRC and the CATIA project of DFID are among these initiatives aimed at increasing universal access to ICTs in Africa and bridging the digital divide. The delivery of low-cost bandwidth remains a key objective of these initiatives and critical for bridging the chronic problem access in the region.

Low cost satellite-based access to the Internet could respond to the current access crisis in the region and provides an opportunity for last mile connectivity to rural people. The vast inaccessible terrain makes it difficult and costly for rolling out traditional wireline networks and implementing advanced fiber optics links in heartland areas. The lengthy time needed to rollout traditional technologies makes low-cost Ku/Ka band satellite services attractive particularly to smaller organization, households, personal users, small and medium enterprises and public organizations.

However, the leapfrog to wireless technology was not easy, it was hindered by the policy and regulatory environment. Access to VSATs is prohibited in some countries. In other nations hefty licensing fees are levied. Policies for low-cost 'consumer grade' satellite services for Internet access are not clear in many nations. Recent surge in the use of Voice over IP by average consumers and continued falling of PT&T revenue streams have complicated the matter. Government policies did not keep up with technological developments, and most countries are still protecting their monopoly national telecom operator at the expense of affordable and universally accessible services. Much of the restrictive policy owes to general lack of understanding of the technology and its impact on the society.

In countries where private satellite services are allowed, the license fees are usually excessive for consumer-grade Ku-band VSAT when compared to what consumers in the developed countries pay for these services. The tariffs were ideal for the older satellite technologies which were far more expensive to operate, largely confining their use to a few large multinational companies. At the moment, lofty license fees are the major obstacles to Internet development in Africa, where up to 35% of ISP expenditures goes to VSAT license and monthly charges. Licensing fees in Africa range between $5000 and $10,000 dollars a year per terminal on an average for a 128 Kbps link. Although is a significant progress in reducing both licensing and monthly fees, there are high potentials for mass deployment of equipment costing $1000 and Internet bandwidth at $200/month or less.

Technically, every inch of Africa is covered by VSATs. The major operators like New Skies, Intelsat, PanamSat, EuropeStar, Eutelsat, Thaikom and Anatolia/KaliTel have a variety of different footprints over parts of Africa to supply voice, broadcasting and data circuits to a variety of customers, who then could resell to end users, create Virtual Private Networks. Recent launch of satellites by Intelsat, Panamsat and New Skies has also extended the amount of available bandwidth for sub-Saharan Africa.

Significant experience and interest has also been gained in the installation, maintenance and subscription services over the last ten years. Among the companies that are currently providing services are, Afsat (headquartered in Kenya), MenaSat/GDBC (based in Egypt), IVSAfrica (based in Spain), Web Sat (a branch of Dublin Ireland based Armstrong Electronics), Thaicom Internet (part of the Thai group Thaicom), Bentley-Walker (UK), Linkserve/Linksat (Nigeria), Qkon (South Africa), Sentech (South Africa) and Transtel (South Africa) and GS Telecom. Afsat and GS Telecom have been operational for sometime and had accumulated a good experience in rolling out services in most complex policy and regulatory environments. GS Telecom who specialises in mobile connection has full VSAT operator licences in Nigeria, Ghana, Cote d'Ivoire, Tanzania and Mozambique and has obtained end-user authorisation on behalf of its customers in a further 22 countries. Afsat is also in the process of building a similar continent-wide service.

VSATs have been in use in Africa for sometime to provide Internet connectivity where there is no other high bandwidth infrastructure and as an intermediary product to provide improved Internet access speeds at a lower price than other solutions. There has been a growing interest in their use in the voice application. Countries like Botswana, Ethiopia and South Africa have deployed a large array of terminals to extend their national telephone infrastructure and Internet access. VSATs were also deployed in Democratic Republic of Congo, Ghana

Mozambique, Nigeria, Rwanda, Tanzania, Senegal and Uganda widely to provide Internet services. Until recently the public telecommunication operators (PTOs) have been the main users of VSAT technologies. However the process of liberalisation has opened up avenues for new licensed service providers both in the voice traffic market and Internet business.

One of the key advantages of VSAT is the ability to address the need to deliver remote access quickly. Shorter rollout time means the technology is ideal to problems facing many African countries. The lowering of costs through increased economy of scale would create options for delivery of a wider range applications including rural telecoms, distance learning, telemedicine, disaster recovery, offshore networks, as well as a host of other corporate and government applications. There are already a number of public and private firms - from banks, stock exchanges and ISPs, to schools, hospitals and rural/semi-urban telecentres that use VSATs to deliver business, educational and health information. The trend over the last five years shows that VSAT technology could become a mainstream telecommunications service in the near future.

Mass deployment of high bandwidth VSATs will have significant impact on small businesses that are currently constrained by a slow and sometimes unreliable dialup connections. The availability of uplink bandwidth of about 100 Kbps and down link of 400 Kbps with a lower licensing fee and terminal and monthly charges will open a vast array of opportunities for institutions to make their bandwidth intensive development applications available to users. Larger organizations are already exploring a committed information rate (CIR) services at up to 2Mbps to create their virtual private networks. Ninety percent of the private sectors in Africa are generally small institutions that could greatly benefit from sharing VSAT links among a group of enterprises.

However, the landscape of the regulatory and licensing needs to change to enable users to reap these potentials. While many governments have began recognize the benefits of VSAT and adopt enlightened regulatory approaches to facilitate the deployment of VSAT-based systems and networks, there are still difficulties in reaching a regional consensus for their blanket exemptions that would have facilitated their widespread use. A number of forces such as the ITU Global Mobile Personal Communications by Satellite Memorandum of Understanding (GMPCS-MOU), increasing interest in entry into the World Trade Organization and the Tampere Convention on the provision of communication source for disaster recovery are driving governments to adopt enabling policies for expanded use of VSATs as part of an overall policy and governance package they set to commit themselves within the framework of NEPAD.

The Catalysing Access to ICTs in Africa (CATIA) project is also working with regional regulators towards achieving an enabling environment for low cost Ku/Ka band Internet access through the elimination of the prohibition on private use of VSAT by African countries, through the adoption of a regional consensus towards a blanket exemption and mutual recognition agreement type-approval and through the creation of a one-stop-shop (OSS) for satellite service providers as a single point of contact for information about licensing requirements across the continent and more importantly, to provide for the submission of licenses.

The ITU are also conducting a survey and preparing a report that "will assist regulators y identifying regulatory approaches that have been successful in facilitating a competitive environment, thereby enabling appropriate satellite-based technologies suited to all stages of development". This report is expected to be released in September 2003 although we understand that the primary data will not be made publicly available. We will work to encourage that this primary data is available in the public domain. We will work to ensure that our research does not duplicate the ITU research and incorporate their findings as much as possible within the final research report from this proposal.

The Programme
A systematic analysis of the current state of VSAT regulatory framework, end-users application, cost structure and technical issues is critical for the success of the CATIA project and for wider understanding of the implication of wireless technology to social and economic development in Africa. This programme aims to carryout research on the application and regulatory framework of VSAT technology in Africa to fill the gap in understanding of current state of affairs of the technology and its future implication for social and economic development.

 The main objective of the project is to undertake research on licensing and use of Very Small Aperture Terminals (VSATs) technology for social and economic development in Africa in support to the CATIA project. The project aims to begin with the investigate broader regulatory and policy issues that impinge on VSAT technology in general and licensing and competition pertaining to local service providers and satellite operators in particular. This will include licensing requirements for satellite operators and service providers, level of usage of VSAT technology for voice, corporate data and Internet services provision, the bandwidth structure, legislation, regulation and licensing fees.

In addition, the project will explore international and regional regulatory aspects and interests around the world.   The project also seeks to analyse the actual and potential application of VSAT technology for social and economic development particularly to health, education and business in Africa It will:
- Investigate the current available bandwidth at global, regional and local levels, patterns of use of this bandwidth by voice and Internet service providers and the pattern of ownership of VSAT technology by organization, small business and individuals in the region
- Explore technical and human resources issues relevant to deployment of services around VSAT technology in Africa
- Examine commercial aspects of VSAT technology including costs to institutions and users

By investigating the above at national levels and looking at broader issues like international and regional trade and governance in the ICT sector and development in Africa, the project aims to provide useful strategies to create the enabling environment for widespread use of VSAT technology by public, private and civil society organizations in Africa.

Beneficiaries

While development agencies, academics, national policy makers and regulators are the direct beneficiaries from the understanding of the prospects of VSAT technology in Africa, the ultimate beneficiaries will be the general population of Africa who will have much improved access to variety of services provided by Internet, especially in the rural areas, which have little immediate prospect of obtaining access without the use of satellite.

By creating better strategies for deployment of the VSAT technology, the project would increase the success of the CATIA and other projects in this area, would benefit local businesses and satellite operators which supply the services and subsequently national governments which will see much improved rural connectivity, increased investment and a greater tax base. Overall, the achievement of a more consistent and transparent regulatory environment based on the insight of comprehensive research and analysis will reinforce recent commitments to the African Union and NEPAD, creating an improved image to the rest of the world that national governments 'mean business' and are committed to joining the global information society.

Activities

The project begins with development of survey instruments such as questionnaire and interview schedules and data collection strategies including the use of local researchers/informants. Two or more consultants will be engaged by the Link Centre to bring different perspectives and experiences from different regions. It is proposed that one of these consultants is Geoff Daniell who is the Global VSAT Forum (GVF) representative in Africa, based in South Africa, and also a member of the CATIA team. He has extensive experience and network in this area and will able to draw in the existing knowledge and expertise of GVF. The other consultant(s) will be evaluated based on their extensive background on social-economic, policy and regulation and technical aspects of wireless and VSAT technologies.

The Global VSAT Forum (GVF) currently has a VSAT regulatory database and is in the process of undertaking a survey to update this database. GVF have offered to make their survey results publicly available to support the CATIA project. To date they have had approximately a 20% response rate in Africa to this survey. The work of this project will support the collection of the remaining data and will develop additional survey instruments to fill gaps in information not being obtained by the GVF survey. A copy of the GVF survey is included in Appendix A.

There after the project will proceed as follows:

- The consultants will develop the survey instruments, and these will be circulated to key stakeholders such as CATIA and IDRC for comment.

- Upon receiving the comments from stakeholders and other experts, the GVF will launch a VSAT application and policy survey in Africa using GVF internal resources, correspondents and local enumerators/researchers/informants. Local researchers will be used to increase response rates and help the project to get accurate details of actual application, cost structure, regulation and licensing of VSATs in African countries, that would otherwise be difficult to capture with questionnaires.

- The consultants will begin creating a database of survey results of at least 30 countries in Africa, representative of the four major sub regions; the SADC, ECOWAS, East Africa and North Africa.

- In parallel with the creation of databases based on national survey results, the consultants will carry out a review of the state of the art of VSAT technology, available bandwidth, global and national regulatory frameworks and socio-economic development trends in Africa. In addition they will:

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      o undertake an in depth analysis of VSAT use in two countries (preferably in South Africa and another country that has deployed VSATs significantly) in order to make the case for large scale rollout
      o review experiences in other regions in the use of VSAT technology for social and economic development

- Following the availability of a draft report that will be circulated to key stakeholders, the GVF will organize a workshop on the use of VSAT technology in Africa during which survey results presented, policy, regulatory and application issues will be discussed

- Finally, the consultants will produce a comprehensive final report incorporating discussions during the workshops for submission to IDRC and CATIA.

Expected Output

The project will have two major deliverables:
- An extensive database on regulatory and policy issues on VSAT technology application in Africa
- A research report outlining actual regulatory frameworks and applications and potential strategies for mass deployment of VSAT technology in Africa

The results of this research will be publicly available through the LINK Centre and CATIA websites and the results will be promoted and disseminated to key stakeholders by the CATIA project to ensure maximum exposure, use and benefit of this research.

Programme Management and Partners

The GVF will manage this research project which fits within and supports their Africa policy reform initiatives. The Manager of this project is Geoff Daniell.

The work on this project will be supported by the *CATIA* team who will provide input into the development of the survey, support the collection and analysis of results, input into the draft report and participate in the workshop. This proposal fits within the six month inception phase of the CATIA project and will benefit from the work of the CATIA team during this time. The CATIA team will be engaging in consultation with regulators and key stakeholders in this field to start the process of obtaining buy-in and consensus at national, regional and sub-regional levels. The overall CATIA project is being managed by Claire Sibthorpe and the VSAT component is being led by Lishan Adam with support during the inception phase from Mike Jensen and two national regulators who are being selected and will help lobby regulators in their respective regions.

The LINK Centre through its IDRC funded Africa ICT policy research project, the APC Africa ICT policy monitor project and the CATIA programme are all seeking to research, analyse and disseminate ICT policy information as components of their work. Therefore, the LINK Centre, CATIA and APC are currently exploring collaboration on the web resource of African ICT policy information. We are exploring pooling our research and information resources into a common database which can be accessed through the CATIA, APC and LINK Centre websites to enable the target users of these projects to have easy access to, and benefit from, these resources. Collaboration will also ensure we are avoiding duplication of effort and resources in this area. We are also exploring the feasibility of collaboration on the other tools to be made available through our respective websites such as collaborative research and discussion spaces.

The *Global VSAT Forum (GVF)* is an association of key companies involved in the business of delivering advanced digital fixed 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. They will make their expertise and networks available to support this research activity. Their Africa representative Geoff Daniels will be one of the consultants on the research team and they are well positioned to help identify additional consultants and local researchers. They are also making their existing data on African VSAT regulation available to this project.

Implementation Schedule

The project is envisaged to take place within six months after signing of the agreement. It will be implemented as follows:

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- Development of survey instruments – August/September 2003
- Regional survey on VSAT technology applications and use July –September 2003
- In depth country surveys – September 2003
- Draft report – September 2003
- Regional Workshop – September 2003
- Final report – November 2003

Appendix A: Overview of the CATIA Project

The Catalysing Access to ICT in Africa (CATIA) programme aims to enable poor people in Africa to gain maximum benefit from the opportunities offered by Information and Communication Technology (ICT) and to act as a strong catalyst for reform. It will support a package of strategic activities to improve affordable access to the full range of ICTs, from Internet to community radio. This programme is focussed on addressing on the need for ICTs to address social and economic development issues. It will be working to help build capacity across Africa to achieve sustainable change.

CATIA is a three year programme of the Department for International Development (DFID) in close collaboration with other donors and players (e.g. Sida, IDRC, CIDA, USAID and Cisco). It will be implemented in close coordination with the Canadian government's Connectivity Africa initiative. It is being managed by Atos KPMG Consulting from a programme office in Johannesburg, South Africa.

The CATIA programme consists of nine distinct component projects. These are:

- Component 1a: **Low cost satellite Internet access** widely available across Africa.

  The new low-cost VSAT-based Internet services could have a significant impact on improving access to the Internet in Africa. This component will focus on low cost satellite licensing and regulations in order to eliminate barriers to the rapid deployment of this technology. It will focus on the elimination of prohibition on the private use of satellite; a blanket exemption and mutual recognition agreement type-approval for low-cost Ku/Ka band VSAT terminals for Internet access; and the creation of a one-stop-shop 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 form

- Component 1b: Robust **African internet backbone with exchange points** at the core and strong African ISP Associations

  This component will support the African Internet Service Providers Association (AfrISPA) in the development of an increasingly influential networking of national ISP associations involved in driving an informed reform process as well as an African-based team that would act as a catalyst for the uptake of Internet Exchange Points (IXP).

- Component 1c: **Well-informed, lively and inclusive policy debates** across Africa, shaping the local policy environment

  This component will catalyse ICT policy and regulatory reform, through supporting a range of organisations and advocacy groups from the private sector, consumer groups and civil society.

- Component 1d: **Positive policy environments for radio broadcasting** across Africa

  This component will help shape a policy environment within African countries that supports and nourishes a genuinely plural, diverse range of broadcast institutions, including an explicit acknowledgment of and provision for community broadcasting, public service broadcasting and a recognition of the importance of broadcasting for guaranteeing democratic and inclusive societies. It will also build capacities within society to provide analysis, research and undertake advocacy to democratise and improve broadcasting in the target countries.

- Component 1e: An African led network of institutions, actively **strengthening the African expertise involved in setting ICT related policy**

  This component will support an African-led network of institutions that will strengthen the regulatory, policy, managerial and technical expertise available to set and maintain appropriate ICT policies in Africa and therefore facilitate access provision in poor communities. It will support the provision of African focussed courses and an effective peer-to-peer sharing of expertise and experience among African policy makers and regulators.

- Component 1f: Increased capacity for African developing countries to **participate in international ICT decision making**

  This component will support the Louder Voices initiative aimed at increasing the participation of developing countries in international ICT decision making processes by establishing two small specialist African units to collate, analyze and disseminate information on international decision-making issues affecting ICTs and their implications for national policy making, including their impact on poverty and development. It will also provide a web based information resource on these issues.

- Component 2a: **Low cost computers and open source software** being developed and tailored to the African market (led by Panos Institute)

  This component will support the ongoing efforts of Africans seeking to identify strategies for the development of appropriate low-cost computers and open source software in order to help broaden access to information and communications in Africa. As part of this it seeks to act as a catalyst for developing strategic South/South and/or South/North partnerships in this area.

- Component 2b: Stronger **network of community radio, FM and public service radio stations across Africa, offering good pro-poor radio programmes** (led by Amarc)

  This component will:
  o   assist community and, where appropriate, commercial and state-run broadcasting radio stations in getting on-line and improving connectivity;

  o   investigate and analyse training options for African broadcasters and identify areas for development and improvement as well as develop the ICT and production skills base of radio station employees and volunteers through direct training delivery and through training of trainers;

  o   maximise the networking and information sharing of the Internet for African broadcasters and support broadcasters in producing content for exchange; and

  o   enhance the availability of content which can improve the quality of pro poor radio programming and support the development of high quality local content that can contribute to development goals.

- Component 2c: A thriving African based **Open Knowledge Network, catalysing the creation and exchange of local content** (led by OneWorld)

This component will strengthen the abilities of local communities and organisations in developing countries to create, synthesise, adapt, and exchange valuable, and potentially wealth-generating local content, including appropriate knowledge from elsewhere.