Internet

Availability of Computers

The Commonwealth Network for Information Technology (http://www.is.lse.ac.uk/ifipwg94/ifipnews.htm#3) put forward the argument that computers are more widely available than televisions, hence providing greater access for internet communication.

Intel Corporation now expects computer sales to overtake TV set sales in 1999, but the gap in per capita computer availability is widening. Whereas the number of computers per thousand people is 300-500 in countries like USA and Norway, the world average is 36, in India it is 1.1, and sub-Saharan Africa with its 500 million people less than one.

Internet in Africa

http://www.is.lse.ac.uk/ifipwg94/ifipnews.htm#3 describes research, noting the change in the technological environment by the recent proliferation of Internet access points in sub-Saharan Africa and South Africa.

Uganda is still backward, but Internet facilities have grown from a non-profit Fidonet node two years ago sending email via a modem linkup to GreenNet Gateway in London to now two major commercial providers with 128Kbits VSAT links and 1- 2,000 users. South Africa is at the other end in sub- Saharan Africa: from a start in the mid-80's, the country now has 40-50 Internet providers with at least 1,000 new users per week (100% growth per year). Around 500,000 students and staff in tertiary institutions also have access to Internet. There are also massive efforts underway to expand telecommunication services to previously neglected areas, both urban and rural. South Africa is expected to be the technological and economic locomotive in sub-Saharan Africa.

Global Telemedicine Network

According to the International Telecommunications Union (http://www.itu.int/ITU-D/bdtint/general/specialprog.htm), most developing countries suffer from a severe shortage of health care professionals, especially in remote and rural areas. They need improved communications between remote health centres, urban hospitals and international medical specialists; better supply of pharmaceuticals and other medical supplies; efficient access to information on distant hospitals' bed capacity and programmes on health care practices. For these and many other needs, the Global Telemedicine Network provides:

- Access to medical services and data bases via the Internet - for identification of problems or information on new developments
- Teleconsultation and tele-education - for health care professionals and public health programmes

- Vital signs monitoring - communication of patient data to distant doctors using simple devices for recording ECG, pulse rate, oximetry, blood pressure and respiratory parameters
- Image transfer and videoconferencing - for distance conferencing, consultations with local and international specialists.

Using Telemedicine, medical assistance and supplies can be delivered rapidly to developing countries and in particular the LDCs, for health care and management of epidemics. Pilot projects are under preparation in Cameroon, Mozambique, Tanzania, Uganda, Ukraine and Uzbekistan.

Countries with low GNPs will qualify for free medical information over the Net

http://news.zdnet.co.uk/story/0%2C%2Ct270-s2090993%2C00.html reported that six of the world's leading medical journal publishers pledged on Monday (9th July 2001) to use the Internet to give third world medical institutes access to their publications free of charge or at a drastically reduced rate.

The deal, brokered by the World Health Organisation (WHO), will enable almost 100 of the world's poorest countries to gain access to vital scientific information that they otherwise could not afford. The service -- which does not yet include any American journals -- is scheduled to launch in January 2002, and will last for at least three years.

Developing countries will be assessed according to their ability to pay for the information. In the 65 countries where the GNP (Gross National Product) is less than $1,000 per capita per year, the service will be completely free, and for the 30 countries where the GNP is between $1,000 and $3,000 per capita the journal subscriptions will be "deeply discounted".

The initiative is part of the United Nation's Health InterNetwork project, focused on providing public health workers, researchers and policy makers with access to up-to-date health information via an Internet portal.

Australia to train developing countries via the net

According to http://www.ananova.com/news/story/sm_366562.html, Australia is to spend millions of dollars on bringing education to developing countries over the internet.

Tens of thousands of teachers, students and officials will be trained in specific skills over the net, becoming 'virtual students' of Australian universities.

As well as offering courses, Foreign Minister Alexander Downer said Australia would also help with the cost of setting up the necessary technology centres.

Mr. Downer said the $200 million (£72 million) scheme, to be known as the Virtual Colombo Plan, would become a reverse version of the original Colombo Plan. That was a 1950s aid programme by which thousands of Asian students and professionals came to Australia to acquire state-of-the-art skills to help develop their countries.

Initially the scheme will concentrate on setting up technology centres outside the main cities of around 12 poorer countries

The plan will link in with a $1.5 billion World Bank plan to use the internet to help developing countries speed up knowledge acquisition rather than becoming victims of a 'digital divide'.

The Internet in Developing Countries

The internet can bring opportunities. Pan Asia (http://www.compusig.org.uk/articles/devcount.htm) is running a pilot project in areas of northern Pakistan, via telephone lines. Using digital photography, Gilgit Eye Hospital is able to consult specialists worldwide.

The Internet can also be disempowering. The risk is that it will bring with it new forms of dependence on and economic subjugation to the North. Heyzer tells of a local industry project in Guyana, where traditional gender roles and expectations did not adapt to the opportunity the Internet offered. Issues such as these must be addressed if the Internet is not to become a white elephant.

Therefore, the internet may not be the most suitable media to be accessed by people in developing countries, where literacy levels are often low, and gender imbalances exist. It is also shown to disempower the people, which will hinder development.

Multiplication of internet use from a few computers

http://www.oneworld.org/ips2/oct00/02_20_005.html gives news about how internet use can be widely extended by the use of only a few community computers.

Multiplication takes place, for instance, when a single telecentre with a few computers can multiply the number of people connected by a factor of 20 or more, giving access to hundreds of people with only a dozen computers.

Bringing advanced communications technologies to grassroots organisations

Beginning in 1987, the Institute for Global Communications (IGC) (http://www.igc.org/html/aboutigc.html) played a formative role in bringing advanced communications technologies to grassroots organisations worldwide working for peace, human rights, environmental sustainability, women's rights, conflict resolution and worker rights. This is done through flagship global computer networks, and hosting websites for non-profits.

Computers to Facilitate Training

The Digital Partnership (http://www.digitalpartnership.org/solutions_rural.htm) is an international partnership facilitating innovation and affordable access to technology, training and the Internet for learning, enterprise and development in

developing and emerging market economies through a sustainable private/public partnership model.

The website gives case studies from the South Africa programme of facilitating doctors, teachers, etc. by supplying computers, training and technical support.

Partner: NICRO

Women's Westville Prison: e-learning centre to train female prisoners with 12 months sentence left in life skills and computer skills, and all staff of the prison in computers skills. Commitment by Digital Partnership – PCs and training for ITC support staff

Soweto Centre – a Digital Partnership Resource and Learning Centre opened in July 2002 serves the adjoining technical college, which do not have access to PCs. This centre also serves the adult community and surrounding 6 schools and teachers who only have one computer in each school. Commitment by Digital Partnership – set up of Centre, PCs, enhanced technology

Partner: Accenture - POP-UP Centre

This aims to test the application of the Digital Partnership to community projects with the homeless through a non-profit refuge and retraining centre in Pretoria for homeless adults and school for young boys. E-Learning Centre for teaching of ICT skills and an Internet Café. Commitments by Digital Partnership- supply PCs and associated training.

Limitations to Internet use

http://www.oneworld.org/cta/afagrict-l/telecentres.htm gives information about MDIC (Maputaland Development and Information Centre). It is an integrated rural development project in South Africa. The MDIC is a community-based organisation with a diverse range of projects, including a Telecentre.

Little Internet use takes place because the people don't know what information is available says the Telecentre manager, Sihle. Market information is also not accessible through the Internet yet, so many of the Nguni cattle farmers and vegetable producers in the area can't use it yet to find out the current prices before taking produce or animals to the market 300kms away.

Summary: Internet

The internet holds a vast collection of information, and can also widen the audience to local radio stations. However for many local communities in developing countries the information is not relevant or represented. The examples of telemedicine show that the internet is only used here by the well-educated. Access to the internet is also limited by the number of computers, and literacy levels. Therefore, telecentres play a vital role in providing the facilities and understanding required to operate the internet. If the internet is to be used

to improve development it should be combined with other media sources, as is often done in telecentres.

Community Telecentres

Telecentre is a rather loosely used word to describe places that offer the public connectivity with computers and networks. A public place where people can get a variety of communication services, and where a major part of the operators' purpose is to benefit the community.

The more narrowly focused cyber cafés or Internet kiosks are also important because of their potential to become telecentres as they mature.

Reducing the digital divide through combined local media

http://www.unesco.org/webworld/news/pdf/telecentre-us.pdf gives information about community multimedia centres, which can combine local media, especially radio, by local people in local languages with ICT and a public library. This can reduce the Digital Divide.

The website also includes information on how to get added value when setting up multimedia centres (including community TV).

The International Telecommunications Union (http://www.itu.int/ITU-D/bdtint/general/specialprog.htm) has helped to develop the concept of Multipurpose Community Telecentres (MCTs); a shared information and communication facility for people in rural and isolated areas. Such centres provide information technology and telecommunication facilities, user support and training for the majority of the population of a community who cannot afford such facilities on an individual basis and/or do not have the skills to use such tools.

Besides access to public telephone and fax, the MCTs may offer (shared) office facilities for local small business and "teleworkers", including computers, printers and photocopiers. Such centres provide access to data networks (e.g. Internet) for e-mail, file transfer, electronic libraries and databases, government and community information, systems, market and price information and environment monitoring. They may also offer support and facilities for teletraining and telemedicine, and/or provide equipment and training for local production (and reception) of radio and TV broadcasting programmes. Such facilities are planned for two of the MCTs in a pilot project, currently being implemented in Suriname in order to promote local culture.

Pilot projects are being implemented, in partnership with concerned UN-agencies and NGOs as well as national partners, in Bhutan and Vietnam including projects in five African countries within the framework of the UN-System-wide Special Initiative for Africa. These pilot projects provide a test bed for new technologies, applications and services relevant to the populations in rural and remote areas and are expected to provide "best practice" models for provision of universal access in such areas.

Telecentres in the UK

http://informationr.net/ir/4-2/isic/ellen.html gives information about telecentres, particularly in the UK.

Within the UK telecentres are being established as well as other initiatives such as Community Networks which provide electronic community information. Telecentres provide local centres where individuals can utilise ICT for personal or business use in order to gain access to electronic information. These developments are aimed at providing access to ICT to those who do not have such facilities in their own home or workplace; to ensure that they are not excluded from accessing increasing amounts of electronic information. Teleservice centres typically have trained staff dedicated to support and training for users.

Emerging themes of Telecentre use in the UK
- The importance of informal information and communication in dealing with everyday situations;
- Access - the most important factor is cost, not providing the hardware. People do not feel they have access when they have to pay £3.00 per hour to use a service;
- Patterns of usage - people either use alternative information sources or seek out access that is free (friends, college, businesses out of office hours);
- Need for support in using the Internet - this is crucial in order to encourage novice users not providing support will effectively exclude a large number of people;
- The Internet is becoming too slow for efficient use;
- Online shopping - hypothetical situations show a lack of enthusiasm for this activity;
- Older people - those interviewed have been enthusiastic to learn about the Internet.
- Community involvement strategies - few identified from the pilot and first case study; development is driven by category of funding sources available.

The African Telecentre Experience
http://www.oneworld.org/cta/afagrict-l/telecentres.htm gives information about access to ICTs in rural areas of Africa.

Example: Ghana
In Ghana there are numerous Internet access points located at 'Communication Centres' mainly in urban areas.
A pilot project is proposed for the Volta Region of Ghana. The aim of this project will be to test the hypothesis that global knowledge can be converged within a target rural African community to decode and integrate indigenous African knowledge into modern knowledge and, as such, can lead to human capacity

enhancement, rural poverty alleviation, improved health care and environmental rejuvenation.

We have built a wide network of local and external individuals and institutions, informally for now, around the themes we have developed to provide examples of the blend between knowledge systems. Powered by convergent IT tools, the model translates into a knowledge network which presents indigenous institutions of African knowledge in modern formats. The network will provide connectivity among global knowledge and research centres, similar centres in Africa, as well as access to a specified or target communities in rural Africa. This would provide the mechanisms for brain convergence in national-international research system linkages which would necessarily reach the target rural population.

Example: Nigeria

Fantsuam, an NGO, is running an on-going micro-credit project in Nigeria aimed at alleviating poverty among rural women. As an extension to their existing program, Fantsuam is putting in place a computer based distance-learning programme to meet the educational needs of the rural communities they serve. The Mobile Community Telecentre, which is run by Atsen Ahua for Fantsuam, uses a van that is rigged to carry 4 computers between rural communities in a 20 mile radius. The pilot programme will provide:

- communication access to secondary school students to supplement their formal studies,
- access for teachers to re-train for diplomas and degrees as well as a means for Community Health Workers to access information for their re-training and skills up-date.

Example: South Africa

The MDIC (Maputaland Development and Information Centre) in South Africa, as mentioned earlier is a community-based organisation with a diverse range of projects, including a Telecentre. The Telecentre has a particularly interesting project making use of the new digital satellite based broadcast Internet services (which send high speed data down to the standard low cost digital satellite TV dish) to hook two of the local schools to the Internet without the use of phone lines.

Costs (South Africa)

Using the lower frequency radios, normally used for telemetry, running at 460 MHz, is an interesting match with the satellite equipment, and it may be worth applying it in other similar situations around Africa. There are now three satellite Internet broadcasting services in Africa, and their low cost - about $30/month for 64Kbps - combined with license-free use makes them very attractive. They don't normally require a license because standard TVRO/satellite TV has been allowed in virtually all countries now, and as these types of services use the same one-way system, they can usually by-pass local telecom restrictions.

http://www.communitysa.org.za/projrev.htm givesmore information and prices of Universal Access ICT projects in South Africa: 'A full telecentre costs between R150,000 and R200,000. This buys you phones (around 5), Computers (around 4), a photocopier, fax machine, printer, scanner, OverHead Projector, TV & Video and modem. The building also is renovated, with furniture and security being added. A mini-telecentre follows a model developed by the CSIR - a computer in a moveable cabinet with a 3-in-1 (printer, copier, scanner) with phone lines and a modem - costing around R15,000.'

BRACS broadcasting stations
BRACS (Broadcasting for Remote Aboroginal Communities Scheme) (http://www.google.co.uk/search?hl=en&ie=UTF-8&oe=UTF-8&q=TV+Broadcasting+equipment+costs&spell=1) is a network of community broadcast stations. Each BRACS unit costs between $30 000 and $40 000.

Equipment used
The original BRACS design comprised a wooden cabinet that housed all the radio and video replay and transmission equipment that included satellite receivers, UHF transmitter and FM transmitters. Located outside in close proximity to the BRACS room was a satellite dish and a nine metre guyed, pipe mast.

The transmission side generally consisted of two 20 watt, rack mounted FM transmitters, giving a range of approximately 15km and 2 watt UHF rack mounted television transmitters, this equipment was located in the rear of the consoles.

Ten Themes for Telecentre Sustainability:
1. The power of a national commitment by policy-makers who recognise the value of connecting the people of the country through the modern tools of the Information Society, and follow that commitment with funding and organisational support for multi-year programmes.
2. The importance of partnerships in translating national policy into action through governmental and non-governmental bodies at the regional and local levels.
3. The value of having local "champions" (innovators) who can mobilise others (early adopters, opinion leaders) to accept the vision of an ICT telecentre programme.
4. The significant value of community volunteers in operating telecentres
5. The advantages of clusters or networks of telecentres working together in a region to develop and share a variety of resources.
6. The importance of raising awareness about information and ICTs as a valuable resource for individuals, families, organisations and communities.

7. The role of research in creating a viable telecentre enterprise.

8. Telecentres need long term sustainability and business plans that fit the culture of the community.

9. Focusing on information services rather than on computers and the Internet alone to build a local institution more fully woven into the fabric of the community, with a larger base for generating income.

10. Participation as an important goal that requires a strategic approach.

Obstacles to access
Literacy
Relevance
The culture of information
The cost of information
Technophobia
Complexity of ICT protocols
Power

The Role of Training
Training in operating the hardware and software of computers and networks, but particularly reaching out to the community and strategically building a clientele that can make a telecentre demand-driven.

Telecentre personnel may need to train personnel in other organisations such as agricultural co-operatives and community health clinics to help build the recognition that the telecentres can support these organisations and their members with relevant information resources.

Future for telecentres
It is clear that, because of their connection with community development and social change, and with the dramatic telecommunications innovations of the 21st century, telecentres will be a topic for research and development for several decades ahead.

Summary: Telecentres
Telecentres contain a variety of information technologies, so are less likely to discriminate against any one particular section of society, as might happen from a single media source. For telecentres to be useful, well trained staff are essential. Low costs and free licences make financial problems minimal. Examples show that if these criteria are followed, then telecentres can provide information and resources, to aid development.

Katherine Wagner   Gamos Ltd.

Satellites

Satellites in India
http://www.mubs.mdx.ac.uk/research/Discussion_Papers/Economics/dpapno94.pdf describes the development of satellite TV in India.

Since 1975 India has built 25 satellites under the satellite programme (part of the Space Programme) for remote sensing and communication. It combines foreign technological imports (in the formative stage) with local knowledge (in the accumulative stage); both are essential!   However, developed countries appear reluctant and concerned about losing their competitive advantage.

Most satellites are expected to last between 6 to 7 years in the hostile environment of space. India is therefore one of few developing countries to afford and have capabilities for such technology.

Broadcasting commercial programmes to small, remote communities
http://ourworld.compuserve.com/homepages/ggninfo/78.htm gives information that a research program, originally designed to provide the answers to some of the u.h.f. transmission and reception problems, shows promise of "paying off" in the low-cost TV station field.
Sylvania Electric Products Inc. of Emporium, Pa. has successfully developed an experimental *"satellite"* TV transmission system which is designed to provide video reception in areas where good signals are now blocked by mountains, hills, etc.
Under the satellite system of television, transmitted signals are picked up from one or more distant television stations. Those signals are amplified by the satellite station, and then are re-transmitted on a different television channel.
These experiments have indicated that satellite transmitters operating with 10 watts output power and approximately 175 watts e.r.p. will provide acceptable broadcast service within a radius of six miles without appreciable change in the interference conditions of existing stations.

WorldSpace Satellites transmitting programs to community radio
http://www.dse.de/zeitschr/de299-3.htm gives information about WorldSpace. WorldSpace, an enterprise based in Washington, DC, USA, was founded in 1990 by Noah A. Samara, an African of Ethiopian/Sudanese ancestry. Its objective is to provide direct satellite delivery of digital audio broadcasting services to the emerging and under-served countries of the world, including Africa, Asia, Latin America and the Caribbean, and the Middle East. By the end of the decade, WorldSpace plans to have three satellites in orbit to transmit information, education and entertainment programming to a coverage area of over 4.6 billion people.

Small community radio stations or large international broadcasters will be able to rent channels on the WorldSpace satellites to transmit their programs directly to hand-held radio sets on the FM channels. Now that is going global from the local village!

Linking Africa through cable and satellite systems

The International Telecommunications Union (http://www.itu.int/ITU-D/bdtint/general/specialprog.htm) has several projects to improve communication in the developing world:

Africa One

The concept of the submarine cable system linking the African continent and providing both direct links between African countries as well as with the other continents was launched and denominated AFRICA ONE by the promoter, AT&T. Using SDH and WDM multiplexing technology, this cable ring is expected to complement existing and planned land and satellite infrastructure thus enhancing interconnectivity between African countries.

Spacecom

The SPACECOM Project, once fully implemented, will combine satellite and terrestrial communications systems to bring basic telephone services (telematics, data transmission, advanced data applications including tele-health and tele-distance learning) to more than two billion people worldwide.

SPACECOM aims at promoting the wide-spread application of space technology in developing countries, with primary emphasis on increasing the accessibility of telecommunications services in rural and remote areas.

The project activities implementation process is well advanced:

- More than thirty sponsors, representing the world-wide telecommunication industry, satellite owners and operators, governments and regional organizations, have offered cash and in-kind contributions
- More than sixty countries have expressed interest to take part and benefit from the project
- Fifteen pilot projects have already been identified for possible implementation in Africa, Asia, Central America and South America.

Future of Satellite TV

The Federal Communications Commission (FCC) has recognised the need to extend television coverage to communities too distant to receive signals from established stations and too small to support a television station. On August 1, 1955, the FCC reduced the minimum power requirements of commercial TV stations to 100 watts at any antenna height. Public Notice FCC 54991 of August 5, 1954, invited applications for stations which do not propose to originate local programs. These rule changes are the first step in the Commission's efforts to provide each community with at least one television station.

As a result of Public Notice 54991 several stations are now being operated as satellite stations, rebroadcasting programs received by off-the-air pickup from other TV stations. Technical operating requirements of these stations, however, are the same as regular commercial TV stations except for the programming.

It is difficult to predict whether or not the financial advantage gained by lower first cost will be great enough to compensate for the lower income obtainable in small community.

The website also gives advantages and disadvantages of the satellite station/ community antenna system.

Summary: Satellite TV
Launching satellites is extremely expensive and therefore can only be undertaken by rich nations. However, the technology can still be harnessed to relay programmes to community TV stations, although these may not have local content. For remote areas, where normal TV signals cannot reach due to the relief of the land, satellite can redirect its signal to reach them.