THE INTERNET AND POVERTY:  
Real help or real hype?

Governments, donors and development organisations are rushing to realise the benefits that Internet access promises in the fight against poverty. But are the benefits it has brought so far merely isolated examples or are they signs that a revolution is underway?

Access to information is an essential condition of development. The Internet has prompted a change in development thinking and many donor and multilateral lending organisations are radically reshaping their policies for the new information age. But is the enthusiasm among donors for spending on Internet development diverting funds from more traditional forms of development assistance?

The debate centres on prioritising need; how important is Internet access in an area without safe water or even an affordable telephone service? While some health workers praise the satellite system that has brought them e-mail connections and cheap access to health information, others complain that Internet connections will not pay for aspirin or syringes. For some South African schools, the Internet means expanding horizons but others worry that its glamour will undermine the education service; basic costs such as paying teachers may suffer as more and more resources are diverted to hook up to the information superhighway.

Organisations dedicated to spreading connectivity in developing countries are burgeoning. A plethora of new initiatives has emerged, designed to increase and improve Internet use in developing countries. The worry is that co-ordination between these initiatives is poorly developed. While there may be consensus that a good communications capacity is essential for the economic survival of developing countries, donors have yet to agree a common strategy to support Internet development.

Access and use of the Internet is accelerating faster in developing countries than anywhere else. By 2001, the number of Internet Web users in Africa, Latin America and the Caribbean, and Eastern and Central Europe will have almost quadrupled from today’s 7.6 million.

The Internet is now being driven strongly by commercial forces and the Internet sector in developing countries is now highly competitive, profitable and likely to flourish, with or without the help of donors. Sufficient demand for the Internet exists even in the poorest countries to make it a viable, indeed a highly profitable, venture. If the market is ensuring rapid Internet growth, donors and NGOs may need to focus on ensuring access and benefits for the less advantaged.

In terms of its most adaptive component, the World Wide Web, the Internet is still only four years old. Real hype or real help? The jury is still out. Quite simply, it is still too soon to tell.
KEY FACTS

- Internet growth is accelerating faster in developing countries than anywhere else.

- The number of web users will almost quadruple in Africa, Latin America and the Caribbean and East and Central Europe by 2001.

- More than 100 Internet Service Providers have been established in sub-Saharan Africa in the last two years - but South Africa accounts for well over 90% of Internet growth on the continent as a whole.

- More computers than television sets were sold world-wide in 1996 and some of the fastest growth in computer sales is happening in developing countries.

- While more than 17% of the population of low income countries is under the age of 14, less than half the population of low-income countries has access to secondary education.

- It costs around $20 a month for a low volume internet account in North America - and up to around $100 per month for a similar account in Africa.
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Signposts on the Superhighway sets out to encourage reporting on African environmental issues by providing a guide to relevant Web and e-mail resources including news, feature and research sources for both print and broadcast media. It was compiled with the requirements of African journalists and broadcasters in mind but it will be of interest to anyone interested in the African environment.

The guide includes over 150 listings and outlines the contents of each site, how easy it is to use and how frequently the site should be ‘visited’. In addition, the guide includes a short section on how to keep telephone and equipment costs down, a glossary, guides on search engines, a list of further sources of information on the Internet, a section on radio resources, tips on how to create new work patterns and even ideas on how to convince editors to get on-line!

“Undoubtedly, the book’s prime characteristic is its incisive and practical hands-on content. Exhaustively researched and concisely edited, Signposts is a welcome addition to the growing literature on the Internet for Africa,” John Mukela, Executive Director, Nordic-SADC Journalism Centre, Maputo, Mozambique.

“The value of Signposts on the Superhighway is that it not only provides journalists with technical assistance, but more importantly it reduces the impact of cultural imperialism by highlighting African resources,” Anriette Esterhuysen, Executive Director, SangoNet, Johannesburg, South Africa.

“This guide is a practical empowering tool for anyone interested in accessing information and participating in revolutionary global communications,” Birgitte Jallov, Communications Lecturer, Roskilde University, Denmark.

This publication is the result of the first National Training Seminar on Using the Internet for Environmental Reporting in Zambia, held in June 1997. The seminar was jointly organised by the Panos Institute, Lusaka, and the Economic Development Institute of the World Bank in collaboration with ZAMNET, Zambia’s Internet service provider.

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The Internet and Poverty: Real help or real hype?

1. Who's using the Internet in the developing world?

Today, competitiveness in trade and in attracting capital is more knowledge intensive than ever before. Through information superhighways, new technology is eliminating some problems of access to knowledge. But the poor are left with little access to these superhighways, lacking both the vehicles — personal computers, telephones, televisions — and the education and skills to drive them. Many countries need assistance in managing the information revolution to avoid marginalisation and exploitation. 1997 Human Development Report

Internet growth is accelerating faster in developing countries than anywhere else, but it will continue to be available only to a tiny proportion of people in the poorest countries for many years to come. The Internet is still very much in its early stages of growth everywhere and is in its infancy in developing countries.

According to the International Data Corporation, the number of Internet Web users in Africa, Latin America and the Caribbean, and Eastern and Central Europe will almost quadruple from 7.6 million today to 25.6 million in 2001. In the Asia-Pacific region, Internet growth will be even faster, rising from 6.5 million users today to 29.3 million. In the US, the number of Web users will double, from 51.6 million to 106.8 million. Growth in Western Europe will be similar, from 23.7 million to 56 million[1].

Within these regions, several countries enjoy even faster growth rates. Figures from Argentina, Brazil, Paraguay and Uruguay suggest that new Internet connections grew by 352 per cent between January 1996 and January 1997[2].

All but four African countries now have Internet connectivity[3] and, if estimates are to be believed, around 700,000 people on the continent — about 0.1 per cent of the population — are now using "basic Internet services"[4]. This is six times the number of Internet users that existed in all developing countries just three years ago[5].

However, estimates of Internet use need to be treated with caution and, sometimes, with scepticism. Estimates of rapid Internet growth in Africa, for example, mask the fact that most Internet growth occurred in just one country, South Africa. South Africa accounted for more than 48,000 of 50,000 Internet “hosts” on the African continent in 1994[6] and ranks 16th in the world in terms of the number of Internet hosts. The fact remains, however, that the Internet has already reached almost every country in the world and is spreading rapidly within those countries.

Many more people have access to more basic Internet services such as e-mail than to the World Wide Web. According to Matrix Information and Directory Services[7], there were 36 million users globally of the “core Internet” (people who can e-mail, browse the Web and put up their own Web pages) in January 1997 compared to 71 million users of e-mail around the world.

E-mail has always accounted for most Internet use. This is especially the case in developing countries, where a full Internet connection either may not be available or is unreliable and incapable of dealing with the volume of data needed for using the World Wide Web, or may be prohibitively expensive. Matrix predicts that there will be 827 million e-mail users and 436 million “core Internet” users by 2001.

1 A “host” computer is a computer with a permanent Internet connection, to which individual users connect through their (usually smaller) client computers.
1.1 Is it just for the rich, male elites?

In the light of such figures, the Internet comes close to being a mass medium in the industrialised countries but a minority medium in developing countries.

Exclusivity in access to the Internet has led many to brand it as yet another technology that is available only to the wealthy and powerful elite in developing countries. The true picture is more complex, however, and despite lack of access, the Internet is having a real impact.

One consistent criticism centres on the domination of Internet use by men. Access to information means access to power and most societies continue to exclude women from both. Estimates suggest that the global Internet gender ratio has remained static for a number of years, with around 63 per cent male users and 37 per cent female users[8]. Less optimistic is the Association for Progressive Communications’ claim that “male domination of computer networks” is as high as 95 per cent[9].

For many activists, the concept of “cyberspace” is critical to understanding the importance of the new technology for women. “The issue of space has always been central for women and is highly sensitive, particularly in Africa”, argues Marie-Hélène Mottin-Sylla of the Synergy, Gender and Development Programme of the NGO, ENDA Tiers Monde, in Senegal. “The freedom to have access to spaces other than the bedroom and the kitchen, and to fully and safely be able to act in other public spaces is key to women’s full participation in the world’s future. Unless African women can participate fully in cyberspace, they will face a new form of exclusion from society.”

What the Internet means for women is reflected in other traditionally marginalised groups. Much of the South’s Internet use, particularly in the earlier years (1993–1995) has been attributable to low-cost NGO networks. The earliest users and disseminators of Internet use and technology were academic and research organisations and organisations belonging to the Association of Progressive Communications (APC), such as GreenNet (London) and the Institute for Global Communications (San Francisco). These have actively supported or established networks in Asia, Africa and Latin America for years, and often provided countries with their only link to the Internet. Partly because of these initiatives, the Internet may have a greater social impact in developing countries than anywhere else.

These networks successfully targeted key actors in the development process – international NGOs and local civil society groups. APC currently claims “a consortium of 25 international member networks [providing] vital links of communication to over 50,000 NGOs, activists, educators, policy-makers and community leaders in 133 countries.”

The early march stolen by community organisations and academics meant that some of the best informed organisations in developing countries were those campaigning for greater democracy, social equality and protection of the environment.

However, this is now changing as the Internet becomes more commercialised. The Internet sector in industrialised and developing countries alike is now highly competitive, profitable and likely to flourish with or without the help of the NGO or donor communities. Egypt, for example, now has more than 15 commercial Internet service providers, all of which have started since 1995. More than 100 Internet service providers have been established in sub-Saharan Africa in the past two years[10].

Even the Internet’s most ardent enthusiasts urge caution against making excessive claims for it. “There are more radios per capita than telephone lines, let alone computers [in sub-Saharan Africa]”, says Peter da Costa of the United Nations Economic Commission for Africa (UNECA). “Thirty-five of the 49 countries in the world which have less than one telephone per 100 people are in sub-Saharan African. So if the objective is to include more and more communities in the information loop, then radio, and not the Internet, is the technology of choice, and will be for quite some time to come”[11]. Radio covers approximately 75 per cent of Africa’s population and television 40 per cent[12]. The Internet’s 0.1 per cent shows just how marginal a medium it still is.

Nevertheless, the Internet is spreading rapidly, chiefly because it claimed to be the most adaptable and flexible information tool yet invented and is being deployed in an information hungry, knowledge
dependent age. According to the World Bank’s InfoDev programme, “a key development of the last year or so is the accelerated use of the Internet as the networking platform of choice for businesses, institutions and individuals in every part of the world”. Some organisations are pioneering the synthesis of the new and traditional technologies. Pulsar in South America, for example, uses the Internet to feed news stories to more than 1,000 community and independent radio stations in 48 countries.

Projections from analysts support this. IDC predicts that “most growth in Web usage will come outside the United States, as more people in developing countries embrace information technology.” UNCTAD – the United Nations Conferences for Trade and Development – clearly thinks so. It has established a “Trade Point” network consisting of business centres in 125 countries for small and medium-sized enterprises in developing countries to carry out business over the Internet.

“The Internet is an adaptive technology,” says Ashley Oliver of PIPEX, which is developing commercial Internet providers in the South. “It tends to produce what communities require, rather than meeting the goals for which it was put in the first place.” [13]

1.2 Rural access

Internet growth is booming because providing Internet services makes money. Generally, it makes money only where there are lucrative business and middle-class markets and where telephone connections are good. None of these conditions applies to most rural areas in developing countries. In 1994, 63 per cent of the population of developing countries lived in rural areas and this group represents 49 per cent of the world’s population[14].

Arguably, there isn’t much demand for the Internet in rural areas. Installing a simple, affordable telephone service comes much further up most rural farmers’ priority lists than a connection to a global, computerised network – installing a safe water supply is often more urgent still. The plunging price and rapid spread of mobile telephony suggests that telephony could be increasingly available but widespread access to the Internet remains a distant dream. “The Internet is not our priority in the communications sector”, argues Dr Abdul Mejid Hussein, Minister of Transport and Telecommunications in Ethiopia. “We are giving priority to giving telephone lines to our people”, he says.

Nevertheless, some activists are convinced that there is both a long-term social need for Internet access and commercial opportunities in providing it. Professor Mohammed Yunus is the founder of the Grameen Bank in Bangladesh, which seeks to provide low-cost loans to rural women. Yunus is using the bank’s network of “branches” to launch GrameenPhone, which hopes to provide low-cost mobile telephony to every village in Bangladesh. “I envisage the day when it would be possible for rural women to have access to and derive employment from computerised data links based on mobile telephony”, says Yunus. “GrameenPhone in Bangladesh has just launched the process to demonstrate its potential and its effectiveness in bringing rural poor women out of their political, social and economic isolation.”

Yunus believes that such initiatives could fundamentally transform the prospects of rural people. “We are fast approaching a distanceless, borderless world through fast-changing communication technology”, argues Yunus. “Intermediaries of information and businesses will have a smaller and smaller market, and distances between city-centre and remote, isolated villages will become less and less meaningful”, he predicts.

Nevertheless, the obstacles are formidable. Even when rural areas get a telephone line, they usually have to pay far more for it than urban equivalents, and the cost difference is often magnified when it comes to Internet access. “A very low density of Internet nodes in developing countries, mostly concentrated in capitals, prevents easy and local phone call access from areas outside an urban centre”, according to United Nations Development Program (UNDP). “Thus user costs increase prohibitively”[15].

Such problems have been solved in the West by the establishment of low-cost calls that apply nationally for Internet access. In the US, AT&T has set up more than 200 Internet access points, allowing 80 per cent of the US population to access the Internet via local telephone calls.
Similar initiatives in a handful of developing countries are also trying to spread Internet access beyond urban centres. In Senegal, for example, Sonatel, the main telecommunications company, charges nationally a “fixed local rate all over the country to encourage the spread of Internet nation-wide.” The country is developing a rural/provincial Internet “backbone”. Metissacan, a Dakar and Ziguinchor-based Internet service provider and cybercafé, is currently seeking funds to enable them to distribute computers to the more distant reaches of the country, “in the same way that TV was made available through putting them in the community areas of villages”[16].

New technologies – particularly wireless technologies – also make it easier to provide Internet services to rural areas. In mid-1997, for example, a pilot project was launched in Arua, a small town in Northwest Uganda, to provide Internet services through a wireless radio system which was linked to a satellite system. The system, operated by Uganda Connect and the World Food Programme, is designed to serve the needs of hospitals, agricultural projects, NGOs and mission stations in the region.

Clearly some – such as Mohammed Yunus – who have been involved in rural development for many years see clear-cut, concrete opportunities in new technologies such as the Internet, and envisage realistic and sustainable ways in which they can be deployed. What little experience we have suggests that Internet access can spread even to remote areas where there are enlightened attitudes, political will and financial backing. But such examples are still rare. In countries where access to the basic needs of food, water, shelter and health care are still major problems, providing access to the Internet will have to work hard to justify a high prioritisation.

2. Constraints to Internet growth

Developing countries face four main constraints in improving Internet services rapidly: poor telecommunications, an inability to afford computers, lower levels of education and the higher cost of providing Internet services.

2.1 Poor telecommunications – obstacle and stimulus

Poorly developed telecommunications represent both an obstacle and a stimulus to Internet development. Many poor countries have limited telecommunications networks and the Internet is totally dependent on a minimum level of telecommunications infrastructure for its existence.

The number of telephone lines per 100 people – a measurement known as “teledensity” – is perhaps the largest constraint. The average teledensity among developing countries is just 1.5. In very low-income countries, such as Afghanistan, Guinea, Liberia, Niger and Somalia, the figure plummets to 0.002 – or one telephone for every 500 people. In Cambodia, Chad and Zaire, there is one for every 1,000[17]. Some 80 per cent of the world’s population has no access to reliable telecommunications while three-quarters of the world’s telephones can be found in just eight industrialised countries[18].

The few telephones that there are in low-income countries are typically concentrated in the more affluent urban areas; rural areas often enjoy virtually no access to modern telecommunications. About 80 per cent of Kenya’s people, for example, live in places that have no phone[19]. Another major problem, especially for many African countries, is lack of access to international “bandwidth” – the high-capacity international connections that make Internet use possible.

Poor telephone connections do not necessarily make the Internet an irrelevance, however. A key reason why the Internet – and especially e-mail – is so popular in developing countries is its ability to deliver messages reasonably reliably, even when phone connections are poor. The Internet was developed by the US military to enable messages to be delivered even in the event of a nuclear war. Its origins make it an ideal communication medium to deliver messages rapidly and reliably even where communications infrastructures are weak or damaged.

For the first time ever, e-mail has enabled the less developed countries to communicate with one another quickly, efficiently and cheaply, even though other forms of communication such as mail are
poor or non-existent. In an environment where telephone calls are expensive and unreliable, the Internet offers unprecedented opportunities for communication between businesses, politicians, NGOs and individuals, opening up new prospects for dialogue, trade and regional or continental cooperation.

Indeed, those countries with poorly developed telecommunications infrastructures could even gain a long-term advantage in Internet provision. They have the opportunity to “leap-frog” old technologies and install high-quality and comparatively low-cost and high-capacity digital technologies, which are ideally suited to Internet use.

2.2 Access to computers

Problems of access to telecommunications pale into insignificance beside those of gaining access to a working computer capable of connecting to the Internet.

According to the International Telecommunication Union (ITU), “An inhabitant of a high-income country is four times more likely to have access to a television set than an inhabitant of a low-income country; 25 times more likely to have access to a telephone; but almost 8,000 times more likely to have access to an Internet host computer.” More basic still, one in three people globally lacks access to electricity.

Even internationally, the Internet will remain a minority communications medium when compared to the telephone. According to the ITU, there are around 16 million host computers and an estimated 60 million active users of the Internet world-wide. In contrast, there were 741 million telephone users at the start of 1997. Nor is Internet use catching up with telephone use. Although the percentage growth rate of the Internet is far faster than that of telephones – 103 per cent compared to 5.8 per cent in 1997 – there were 48 million telephone lines installed in 1996, almost seven times the number of Internet host computers.

Of the world’s 16 million Internet host computers, almost two-thirds were either located or registered for business purposes in North America. In industrialised countries each Internet “host” serves three or four computer users. In developing countries, each host serves around 100 users.

Analysts agree that the cost of putting a computer in every home, of establishing the necessary telecommunications infrastructure – or, merely, of providing electricity to every house – is prohibitive. Computers cost proportionately far more in developing countries. The cost of an average personal computer is 15 times the per capita GDP of Ethiopia, for example.

Nevertheless, more computers than television sets were sold world-wide in 1996, and the fastest increase in computer sales is happening in some of the poorest countries. Information technology products are increasing in Africa by 12 per cent per year; software giant Microsoft announced in early 1997 that it was opening the first of a series of 12 African sales offices to cope with the demand for its products.

Poverty is not the only problem facing those wanting access to the Internet. Political restrictions are common in many countries and several countries have a politically motivated policy of making access to the Internet unaffordable to all but commercial users. Access to the Internet in China, which is subject to tight regulation, costs around US$70 a month, for example.

Tariffs on imported computers can also make Internet access far more expensive. In India, for example, tariffs on computers reach 120 per cent.

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2 The political implications of the Internet will form the subject of a future Panos media briefing.
Telecentres – access for whom?

Telecentres – the Internet equivalent of public telephone boxes – have been promoted as the solution to making the Internet more accessible. According to the World Bank, such centres “can provide residents, non-governmental organisations and businesses in poor rural and urban areas with economical, easy and ready access to needed information.”

They could, argues the Bank, constitute “a powerful engine of rural development and a preferred instrument in the fight against poverty. They could be the hub at the community level, through which a large number of information services can be dispensed – telephone and fax, local bulletins, document searches on demand, video libraries for entertainment and education, health and nutrition training, government services, market prices, self-paced learning and more. The centres would be multi-sectoral facilities and eventually self-sustaining through fees and contracts”[25].

The numbers of telecentres and cybercafés are growing rapidly. Nearly every national capital in the world now has at least one cybercafés or telecentre. Since May 1996, Peru has been experimenting through a scheme of telecentres, or cabinas publicas. “Based mainly in universities, schools, local government buildings and at private enterprises and craft guilds, the public cabins will each house at least 20 computers, a scanner and a laser printer, connected by dedicated line to the Internet”, according to a report on the project[26].

Similar efforts are underway in Senegal and in the Commonwealth of Independent States countries, Kazakhstan, Kyrgyzstan, Russia and Ukraine, where Internet sites are being established in libraries and universities. Cuba has a network, called Tinored, of 150 walk-in computer centres, 100 of which have e-mail accounts.

In Tanzania, the Telecentre Fund, a joint co-operation initiative of the ITU, UNESCO and IDRC, is planning a multi-purpose community telecentre project. According to the Internet provider, SANGONet, “it is hoped that the local hospital will become involved along with other users, especially in the fields of business, agriculture, fishing, education and local administration”[27].

As with almost any development concerning the Internet, it is simply too early to assess the impact of these initiatives. However, there is little sign of telecentres being extended to areas where they cannot at least cover their own costs – and in most developing countries this means the urban wealthy areas.

The signs are that market forces will guarantee fast and effective access to the Internet wherever there is a market to sustain profits, and where the necessary infrastructure exists to allow its introduction. The telecentre approach was conceived to provide Internet access to those areas where these conditions are not met. It is still too early to say whether Internet access can be made more widely available in poor countries on a sustainable basis.

2.3 Greater need, but much more cost

Given the absence of other reliable forms of communication, the Internet may be more useful and valuable in developing countries than elsewhere. It can also be far more expensive – both relative to per capita income and in absolute terms. An Internet service provider (ISP) that wants to lease an average high-capacity line – essential for providing an effective Internet service – is charged $3,800 per year in the US. In Argentina, leasing the same capacity from the monopoly operator would cost the ISP US$180,000 per year – almost 50 times as much.

The average cost of a low-volume Internet account in North America is less than $20 per month compared to about $65 per month for the lowest priced services in Africa, according to the ITU. When local telephone call costs are added, the average cost probably exceeds $100 per month[28].

According to the ITU, the main factor keeping costs so high in developing countries is government control of telecommunication services. “In most of Africa, for example, communication services are provided under the monopoly control of the national carrier and although the number of ISPs is growing, there are still too few”, says the ITU[29].
Competition among ISPs also helps to keep costs down. South Africa, for example, has managed to buck the trend in Africa of high Internet prices through intense competition among ISPs. There are now more than 70 South African ISPs and South Africa alone accounts for well over 90 per cent of Internet growth on the continent as a whole[30]. According to the Organisation for Economic Co-operation and Development (OECD), peak-rate calls were, on average, 38 per cent cheaper in countries that allow competition between telecommunications providers compared to those that did not.

Competition may not be a universal recipe for success, however. The government closely regulates Internet development in Cuba. Despite the current blockade and the country’s economic crisis, international Cuban computer-network traffic accounts for over a third of the whole of the Caribbean[31].

Comparison of internet charges in selected countries

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<th>Country</th>
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<td>BT Internet</td>
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<td>$38.96</td>
<td>2.7 per cent</td>
</tr>
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Source: ITU and Panos

*based on 1994 GNP. All other figures based on 1995 GNP.

Education – a crucial missing link

Users rather than policy-makers or regulators have shaped Internet development. World-wide, most users of the Internet are young and it is young people who typically have the aptitude and the enthusiasm to push for further advances in new communications technologies.

Developing nations are young – in 1995, more than 17 per cent of the population of low-income countries was under the age of 14, compared with just 9 per cent in high-income countries.

However, low levels of education and literacy cripple the potential advantages of a young and adaptable population. In 1993, more than half the population of low-income economies had no access to secondary education[32]. According to the ITU, “if one excludes China and India, the number of people [in developing countries] with no access to secondary education rises to three quarters of the population...in high-income economies, by contrast, more than 97 per cent of the population have access to secondary education”[33].

Limited use of English is another constraint. Although increasingly multilingual, the Internet is still largely an English-language medium because of its origins in the United States.

It may be that the long-term deployment and exploitation of the Internet by developing countries will depend less on technology and costs and more on their capacities to educate their young populations.
3. The Internet as a development issue

“With the money needed to enter the Internet world, you could feed a family in Bangladesh for a year......And the more the Internet develops, the more it will become basically a commercial place......Communities which are rich will become powerful; but the vast majority will be worse marginalised. I think the Internet will be a weapon of economic power and knowledge”. Prof. Ziauddin Sardar, ed. Cyberfutures: Culture and Politics on the Information Superhighway[34]

“Until recently, telecommunications was considered a luxury to be provided only after all the other investments in water, electrification and roads had been made – and after all the demand for telecommunications in the cities had been met. Instead, telecommunications should be considered a vital component in the development process – a complement to other development investments – that can improve productivity and efficiency of rural agriculture, industry and social services and can enhance the quality of life in developing regions”. Dr. Heather E. Hudson, Global Connections: International Telecommunications Infrastructure and Policy

The Internet is prompting a sea-change in international development thinking and many donor and multilateral lending organisations are radically reshaping their policies in the new information age. The World Bank, for example, has begun to describe itself as the “knowledge” bank and will devote its annual World Development Report in 1998 to the role of knowledge in development.

This shift follows a growing acceptance of the importance of the role of communications in development; an issue long debated by development theorists. Specific research on the impact of the Internet on development is scarce. However, studies in the field of telecommunications over the past 20 years by the ITU, the World Bank and the OECD have demonstrated ratios of benefits to costs of telecommunications usage from 5:1 to more than 100:1, due to improved efficiency in managing rural enterprises, time saving, savings in travel costs and others[35].

If the data from such studies are reliable, the capacity to acquire and communicate knowledge is the foundation of development. If development depends on empowering people and communities to take control of their own lives, access to information becomes an essential component for progress.

Opinions differ on what donor organisations should be doing to support the growth of the Internet and other information technologies in developing countries. There is growing agreement that developing communications capacities is essential for the economic survival of all developing countries – but this agreement has yet to lead to clear cut strategies by donors to support the process.

If the market is ensuring that access is spreading (in terms of physical availability), the donors and NGOs can shift their focus, ensuring that the benefits are maximised and that marginalisation is minimised. Moussa Fall, who runs an Internet service for ENDA Tiers Monde in Senegal, points out that “public awareness and technical training are not the priorities of the private sector”[36]. It is here that many donors have chosen to spend their funds.

3.1 Can we avoid the rusting tractor?

The history of development assistance is littered with failed initiatives to transfer technologies to developing countries. Stories abound of huge shipments of tractors – or lorries or turbines or television transmitters – arriving to transform the prospects of developing countries only to end up rusting and useless through want of spare parts or adequate training to operate and repair them. Such failures have almost always derived from a lack of any feelings of ownership or participation by the groups they have been designed to benefit. If this can happen with a tractor, it can happen with the more delicate and fast-moving technology of the computer.

Such concerns are being fuelled by the rapid increase in organisations dedicated to spreading connectivity in developing countries. The World Bank is not the only organisation of its kind to put Internet and other communications technologies at the centre of its assistance programme. Canada’s International Development Research Centre (IDRC) has, for more than a decade, spearheaded a
A plethora of new initiatives has recently emerged, increasing and improving Internet use in developing countries. George Soros, the international financier, has devoted hundreds of millions of dollars to developing Internet activities in Eastern and Central Europe and in Africa through his Open Society Institute. The Dutch government has recently founded an Institute for International Communications and Development (IICD) to provide technical assistance to developing countries. Numerous NGOs such as GreenNet have also been working for years to help NGOs in developing countries to gain access to the Internet.

There is also a bewildering array of initiatives devoted to increasing connectivity. In Africa alone, there exists the African Information Society Initiative (AISI), the Sustainable Development Networking Programme, the Acacia Initiative, the Leland Initiative and more than 50 other major initiatives[38].

The worry is that co-ordination between these initiatives is poorly developed and efforts may be duplicated. “We seek greater consultation from the various initiatives which aim to steer telematics developments in Africa”, demanded a recent meeting of African NGOs belonging to the APC. Carlos Braga, the Director of the World Bank’s InfoDev programme acknowledges that “there is much greater scope for co-ordination”, while highlighting initiatives that aim to improve donor co-operation, such as Bellanet, AISI and InfoDev itself.

There are other reasons to be optimistic that the rusting tractor syndrome won’t apply to the Internet. Donors claim they have learned the lessons of the past. IDRC’s Acacia Initiative (supported by ITU, UNESCO, UNECA and the World Bank), “aims to include even the most remote and most disadvantaged communities in the discussion and benefits of the rapidly emerging ‘Information Society’”. Information networking among many donors and NGOs is increasing, especially through electronic Internet networks such as Bellanet[39], which offers “support for incorporating ICT-enabled electronic workspaces into the development community’s institutional structures and programme activities”.

The group of donors that sponsors the World Bank-hosted InfoDev project (which includes IDRC) has tried to learn from failed information and communication initiatives over the years. InfoDev’s annual report for 1996 says that “Less than a third of the projects under consideration are focused on infrastructure, and many more are based on pilot projects and “consensus building and awareness raising”[40].

The total cost to donors of Internet development world-wide has yet to be calculated. It is still unclear whether expanding the superhighway is diverting funds from more traditional forms of development assistance, such as digging wells or providing low-cost banking. What is clear is that, whereas Internet growth is independent of donor support, access for those who can use the Internet most effectively to achieve social change will not grow without support.

Internet development also requires new models of financing. The ITU has established WorldTel, which is raising private capital to fund telecommunication links to rural communities and poorer communities in developing countries. Such private/public partnerships may increasingly shape future donor policy in this area.
Winning and losing in the Earth MarketPlace

The potential for a small business, located anywhere in the world, to own a “shop front” on a Web site – as accessible to the same millions of Internet users as the Web site of a multinational corporation – accounted for much of the early excitement surrounding the Internet.

A previous Panos briefing on the Internet highlighted the California-based Earth MarketPlace, which was using the Internet to market organic agricultural products direct from farmers in developing countries to consumers in the US. The profits went straight to the farmers and the middleman was largely cut out. The hope was that such initiatives would provide a new model of bringing produce from developing countries direct to consumers in the industrialised world.

Two years later, the project has abandoned the Internet as its main marketing tool. Re-christened as Global Renaissance, director Jerry A Moles points to some of the problems in marketing on the Internet. “The Web is not ready for the kind of products that we were prepared to sell – teas, coffees, spices, crafts etc. are most frequently sold through other venues”, he says. “As the Web gains momentum, this is likely to change but, for the moment, it is a difficult sale”.

Another problem was gaining sufficient capital to market products over the Web. “While we developed an elaborate Web site with the capacity to sell products, it was difficult to raise the capital to carry out marketing activities”, says Moles. The initiative also suffered from having few reliable ways of guaranteeing the “organic” claims made for the goods. While the firm hopes to return to marketing on the Internet at some stage, for the moment, says Moles, “the Internet and Web have taken a back seat”.

Despite the mixed record of such on-line business so far, experts remain confident that future prospects of ‘e-commerce’ remain rosy. According to International Data Corporation (IDC), Web-based transactions will grow to more than US$220 billion by 2001, and analysts Forrester Research see e-commerce ballooning to no less than $327 billion by 2002. In contrast, electronic commerce totalled $2.6 billion last year (1996) globally[41]. The percentage of users buying goods and services over the Web is predicted to grow from 25 per cent in December 1996 to 39 per cent in December 2001[42]. Perhaps most significantly, IDC predicts that “most growth in Web usage will come outside the United States, as more people in developing countries embrace information technology.”

Several commentators question the assumption that the Internet will bring only economic benefits. “In the information economy, the Internet is a means of transporting goods to market and a means of creating markets through advertising”, says Bruce Girard of Pulsar, in Ecuador. “The goods are information, not Nicaraguan coffee, Sri Lankan tea or sweaters from Ecuador. We could end up with a situation in which the Internet provides the infrastructure for a global economy in which we all import Microsoft products and try to sell handicrafts”, he cautions.

4. The Internet in action

In 1996, the new South African government published one of its first formal government documents – a Green Paper on Telecommunications Policy. The paper asked South African citizens to tell them what they thought were the most important applications of ICT. Top of the list came education, with 73 per cent listing it as a high priority, closely followed by health and telemedicine (55 per cent)[43]. This section looks at what benefits, if any, the Internet really offers these areas.

4.1 Education and academia

“I’ve probably spearheaded giving away more computer equipment to schools than anybody else on the planet. But I’ve had to come to the inevitable conclusion that the problem is not one that technology can hope to solve. What’s wrong with education cannot be fixed with technology.” Steve Jobs, Co-founder, Apple Computer
"There are hundreds of educational projects using e-mail available.....Believe me, it really enhances your teaching" Goolam Mohamed, Maths Teacher, South Africa

At a private high school, located within a university in Ankara, in Turkey, pupils sit in a classroom fitted with a TV and a satellite connection[44]. From a satellite-connected TV studio in New York, a teacher from the Kaplan school teaches the pupils how to succeed in the SAT tests (the exam that helps pupils qualify for US undergraduate university courses)[45].

An impressive demonstration of communications technology in action? Perhaps, except the Kaplan textbooks can be bought in town, as well as the services of local SAT teachers. But prospective parents are impressed by a school that can offer interactive satellite classes from the US, even if they end up costing far more than local books or local teachers[46]. Is technology being used to give the best education that money can buy, or the one that sells best?

In Argentina, teachers have been on hunger strike, reacting to the government’s neglect of schools: “The social crisis is demanding more work of teachers than ever and their salary has been declining since the eighties, when they were paid on average 63 per cent more than today”[47].

According to Theodore Roszak, a self-confessed neo-Luddite, writing on education and Internet generally, “computers are not a free choice. The money to buy them comes from places that need it more. For example: hiring more teachers at better salaries, buying lab equipment, books, art supplies, musical instruments, repairing the plumbing, fixing the roof”[48].

Researchers have found that “aid donors have failed to back up their commitments to ensure basic education for all children by the year 2000 Ö[with] at least one-third of the world’s out-of-school children in Africa, and with mounting concerns about the deteriorating quality of primary schooling in most African countries”[49].

Yet in recent years, it seems that many schools in developing countries have been discovering how they can make “meaningful educational use of e-mail and the Internet”[50].

**Rural education in South Africa**

Philemon Kotsokoane, the headmaster of Micha-Kgasi High School in rural South Africa, has been enthusing about his school’s e-mail connection: “a Pentium 100 PC, a desk jet printer and a data/fax cell phone...to the school was actually used to get messages from all over the world. It was also used for the following:

- communicating with St Hildas for the donation of computers
- water project with an NGO in New Jersey (USA)
- research project on rape
- reports on cell data project research
- compilation of quarterly schedules for all classes
- involvement in the project “Where on the globe is Roger?”
- project on “let’s compare prices”
- all correspondence and registrations for conferences in Hungary and Spain”[51].

Not all rural South African school heads get to go to international conferences but Mr. Kotsokoane’s school has been the focus of an IDRC funded six-month pilot project (part of the Acacia Initiative, mentioned above). The project is investigating the practicality of the use of cell data (mobile phones) for connectivity to two rural schools in South Africa. Both schools are “about 50 km from Pretoria, both in rural areas and both wanted to become part of PretNet (Pretoria Education Network)”[52]. An assessment, carried out by Yorke Rodda, found that the two schools both made a significant amount of use of the e-mail connections they had available, bearing out the testimony of the headmaster of Micha-Kgasi School.

Pilot studies in South Africa (see box) have shown that, once it has been provided, pupils and teachers will make extensive use of the Internet, even in rural schools. Goolam Mohamed, a former
mathematics teacher at Alexander Sinton High School in Cape Town, believes it is: “There are hundreds of educational projects using e-mail available which are very creative and require participation on a very basic level... There are interesting ones which will cater for just about any educational activity teachers wish to plan. Believe me, it really enhances your teaching. I also implemented a cross-curricular project at the school which involved other subject teachers using e-mail in their subjects.....It certainly enhanced the teaching of mathematics when I was still at Sinton”[53]. But the mere fact that a school's teachers and pupils are using e-mail does not prove that Internet is a good teaching tool.

The likelihood of something like the Micha-Kgasi project, even if successful, being replicated all over South Africa, is doubtful. “Only 1 per cent of schools in South Africa are connected...[and] about 75 per cent of the 30,000 schools in South Africa do not have telephones (land lines)”. But the mere fact that a school's teachers and pupils are using e-mail does not prove that Internet is a good teaching tool.

The project does at least demonstrate that schools which do not have land-based telephone lines need not be excluded from "meaningful educational use of e-mail and the Internet"[54]. Although the cost is still prohibitive, the technology is no longer a barrier. If the finances are available, and staff are prepared to take the plunge, Internet can benefit pupils, in diversifying their range of educational materials and broadening their peer group. The Western Cape Schools Network[55], whose mandate is to “provide a range of Internet services, training and resources” is “founded, funded, and led by schools”, and its home page on the Internet contains much subject-oriented material of relevance to students. Perhaps more significantly, it leads teachers efficiently to a wealth of materials relevant to class delivery and curriculum development, both inside South Africa and further afield.

### Virtual universities

While Internet in schools has yet to prove sufficient value for money in developing countries, universities have been some of the earliest and greatest beneficiaries of the Internet and computer networking. Researchers collaborate internationally, far more cheaply and quickly than they ever could before. It would seem that Internet elements would already be applied wisely in development projects focusing on universities.

One such project is the “African Virtual University”, at a cost of $1.2 million to the World Bank’s InfoDev programme. The university is to be “an electronic broker of education – collecting the latest knowledge emanating from universities, conferences and professional associations for use in [Sub-Saharan Africa]; adapting that information into lectures, seminars, courses, and degree programmes...and disseminating it.....using affordable and up-to-date technologies such as on-line data basing, public broadcasting, videotape, satellite and the Internet”[56]. Using scarce teaching resources to reach students all over the continent through an existing, flexible and low-cost communications infrastructure seems an ideal application for the Internet.

But it has not impressed all commentators. An Internet discussion list populated mainly by Africans working with information and communications technologies[57] drew many critical responses. “Some aid projects seem to be designed with the assumption that Africa suffers from a shortage of neurons, rather than hardware”, says Nemo Semret an Ethiopian at Columbia University in New York. “Such a top-down project is going to make things worse. It will create dependency and complacency and of course will never be sustainable......I can tell you already now that after a couple of million are down the drain, the project will go the way of the dodo on the day when the first bill comes due after funding runs out”, according to Dr Eberhard Lisse from Namibia.

Meghistab Haile from Ethiopia feels the same way. “A university professor here gets around US$4,000 a year. With that money [$1.2 million] just imagine how many lecturers you could have. If the World Bank is really wanting to help African universities then the first step would be to encourage and support the Africans to return back. In the end it is only the Africans who could solve their problems.”

InfoDev’s Carlos Braga acknowledges the criticisms while retaining his faith in the project. “We can make a list of the many, many problems that we have identified, from technology to content, to
involvement of stakeholders, but it would be completely inadequate to say that all of those issues have not been discussed and flagged”, says Braga.

Donor organisations and others investing in the Internet for development clearly face increasing scrutiny of what they are doing in education as elsewhere. But few deny that education systems in most developing countries suffer from a chronic shortage of information resources and the Internet has the capacity to play a major role in narrowing this information gap. The question once again comes down to allocation of scarce resources and the dilemmas involved in diverting money from absolute necessities.

4.2 Medicine and health

“While a medical library in the USA subscribes to around 5,000 journals, the Nairobi University Medical School Library, long regarded as a flagship centre for medical literature in East Africa, receives only 20 journal titles today compared to 300 the library subscribed to a decade ago...A recent visit by a SatelLife representative to a large district hospital in Brazzaville, served by 20 doctors, found a library consisting of a single bookshelf, almost all of which were novels. The condition of the university hospital was not much better with only 40 outdated books and a dozen medical journals, none more recent than 1992.” Dr. Bernard Lown, Chairman and Founder of SatelLife

“Information poverty is one of the most serious obstacles facing health professionals in the developing world”, according to Dr Ruhakana Rugunda, former Ugandan Health Minister and now Ugandan Minister of Foreign Affairs.

Most health workers in developing countries operate in an environment where access to information is just one of a host of problems – shortages of medical equipment sometimes as basic as rubber gloves and bleach, inadequate supplies of drugs, sometime even basic medicines such as aspirin; a lack of training and poor pay resulting in a “brain drain” of some of the best doctors to the West.

Access to information is, as Dr Rugunda implies, often appalling. Training textbooks are often out of date and access to information on latest drug developments or preventive treatments are limited. Doctors feel isolated because they cannot get advice on making a diagnosis.

From its earliest days, the Internet has promised the potential to redress the problem and it is in the field of health that the use of the Internet has been deployed first and longest.

The challenge for those wanting to upgrade communications facilities for health care is to demonstrate that using low-cost methods such as e-mail and discussion groups can save lives, reduce isolation and enable doctors to make better, more informed decisions – all at a cost which won’t undermine the fabric of the service itself. The evidence that this is possible is strong, although there are reservations.

Much of the experience comes from SatelLife/HealthNet, which was started in 1989 to promote computer networking in developing countries. It has managed to raise sufficient funds to launch two small satellites, HealthSat I (launched in 1991) and HealthSat II (launched in 1993). It currently serves approximately 4,000 health care workers in more than 30 countries world-wide[58], providing doctors with access to tools. The examples of concrete benefits provided by HealthNet are impressive (see box).

However, after six years in practical operation – an aeon in Internet terms – HealthNet has demonstrated a level of sustainability and, it claims, it is fulfilling an essential service. “In Kenya, HealthNet is well known as a source of information”, says SatelLife’s Africa Regional Officer. “I have seen people walk into the medical school, go to the library looking for an article in an old journal and they don’t find it there. Somebody tells them to go downstairs to the HealthNet office: ‘you get all you need’[59].
HealthNet – a network in action

The practical uses of computer networking are, according to HealthNet, manifested in a host of ways:

- **Physician collaborations.** Burn surgeons in Mozambique, Tanzania and Uganda use HealthNet to consult with one another on patient treatment and reconstructive surgery techniques.
- **Data collection.** In the Gambia, health workers no longer need to travel 700 km per week to collect data for a clinical trial. With HealthNet this information is now sent computer to computer via e-mail in seconds.
- **Health care delivery.** Physicians in Ethiopia use HealthNet to schedule consultations and referrals, making it unnecessary for ill patients to travel long distances with no guarantee of seeing a physician.
- **Medical alerts.** Health care workers in Zaire’s Vanga Hospital use HealthNet to send regular dispatches to report on progress in treating trypanosomiasis to health organisations in the North.
- **Access to medical libraries.** In response to a cholera epidemic in Zambia, the medical librarian at the university obtained literature from her “partner library” at the University of Florida, then disseminated the information to all HealthNet users in the region.
- **Research.** Malaria researchers at a remote site in northern Ghana used HealthNet to communicate daily with the London School of Hygiene and Tropical Medicine and the Tropical Disease Research Centre in Geneva.
- **The environment.** Researchers with the Diane Fosse Gorilla Foundation in Rwanda will use HealthNet to report on endangered gorilla habitats. Data gleaned from this research are expected to have epidemiological implications for human beings as well.
- **Urgent action.** Electronic mailing lists are operated which keep HealthNet users informed of the latest developments in a number of fields. For instance, the proMED mailing list aims to detect disease outbreaks at an early stage and alert doctors who might be in affected areas[60].
- **User database.** The Database of Health Professionals allows HealthNet users to search profiles of thousands of “wired” health professionals, in order to identify others with similar professional interests.

Nor are such communications only useful for medical purposes. Having access to low-cost communications, offered by e-mail, has transformed the fortunes of one Tanzanian hospital: “Before HealthNet services were available, our 800-bed Catholic Teaching Hospital, serving 7 million people, relied on telephone calls and faxes for securing donations of materials and funds. Even short-term medical volunteers were secured by that expensive mode, totalling over US$5,000 a year phone/fax charges! Since HealthNet appeared in the sky, we have increased our ability to raise funds, recruit personnel and acquire materials[61].

HealthNet’s main advantage – reaching people in far off places, often via satellite – is losing significance as Internet access spread across the South. Some now wonder about its future survival as an information service. Mohan Pradhan, the programme officer for HealthNet Nepal, remains bullish, arguing that his service provides access to information especially tailored for use in developing countries. “Information is available from commercial Internet providers”, he acknowledged, “but we can make it affordable to Nepali doctors and our focus on preventive medicine gives doctors and health workers information that has more local relevance than the curative aspect of modern medicine.”

Although many of these services have come in for criticism for being less reliable and less flexible than their commercial counterparts, Buddha Basnet, a Nepali doctor specialising in mountain medicine, argues that the service is cheap and gives access to a wealth of information relevant to developing countries. “I was able to connect with experts on mountain medicine in the United States and run my ideas by them”, says Basnet, who is researching the effect of high altitude on porters who carry equipment for trekking and mountaineering expeditions in Nepal.
However, not everyone shares this enthusiasm for health-related Internet services. Supattra Koirala works at a private nursing home in Kathmandu and says that, in a country where only 14 per cent of the population has access to electricity and only four people in every thousand have a phone, she doesn’t see that the Internet is ever going to be useful as a tool for community health. “Our priorities are hygiene, sanitation, safe drinking water...how is having access to the Internet going to change that?”, asks Koirala.

Pratibha Pandey, a Kathmandu doctor echoes these feelings. “Instead of putting money and energy on hooking up doctors to the Internet, we need to take care of basic health infrastructure first,” she argues.

HealthNet also runs into criticisms that it is too urban based. “The people that HealthNet could help the most are not the ones it is helping yet”, argues Valerie M Inchley of the International Nepal Fellowship. “Those who can access it are those in the capital or major centres or who work with international NGOs. The rural general practitioners in district hospitals are not affected, cannot afford the hardware and would probably not have the facilities or time to use it well.”

Although HealthNet is probably the best known way in which e-mail and the Internet have been applied with success to the health sector in the South, there are other cases, such as the Latin American Health Information Centre (BIREME) in Sao Paulo, Brazil. It has been working to “facilitate access to Latin American health professionals to the best available medical information and literature, and to make possible that the scientific production of Latin America would also be diffused and applied”[62]. Other organisations have conquered overloaded local phone lines, using Fidonet software, which is not only designed to send information safely down “noisy” phone lines, but also allows computers to call each other late at night, when lines are less busy. More recently, cellular telephone and data networks have proved a means of contacting the outside world[63]. There are also ambitious commercial plans to deploy a global network of small, low-Earth-orbit satellites of the type used by HealthNet, which could provide radically new opportunities to build on the work of organisations such as HealthNet.

“About 40 per cent of medicine consists of exchanging information”, argues the World Health Organisation (WHO). Arguments will continue over how to allocate resources between information “software” on the one hand and drugs and rubber gloves “hardware” on the other. For WHO at least, the priority for investment in information is clear. “Developing an adequate and affordable telecommunications infrastructure”, says WHO, “can help to close the gap between the haves and have nots in health care”[64].

5. Conclusion

“Let’s put all this hype about change and transformation in perspective. It’s underhyped”. So says Danny Hills, a fellow at Walt Disney writing recently in Wired magazine. It is a common view among those who argue that computerised communications will fundamentally change the world.

They are probably right. But the hype should not mask the fact that this is only a communications tool – for most in developing countries an expensive one. It has grown because it has earned its keep; it has proved its value to those who use it and those who benefit from it. The same will apply to its development value. Its users and beneficiaries will ultimately need to be convinced of its value. The Internet is no panacea and it will not absolve development workers from forming sound strategies in other areas.

Infrastructural constraints and poverty will limit access but the bottom line is that this technology favours the small user. If governments and donors find effective strategies to fertilise its use among those who currently lack access, they may ensure that today’s isolated examples of success become the norm.
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