MARCH 2003 • OLOF HESSELMARK

A Country ICT Survey for Namibia

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Executive Summary

This report covers the fifth in a series of country ICT surveys commissioned by Sida as part of its ongoing programme to support the use of ICT in developing countries. The project team used desk research to obtain background information before undertaking a field trip to Namibia. During the two-week period of the trip, just under fifty stakeholders were interviewed across a range of public and private organisations. Several visits were also made to Internet Cafes in Windhoek and Oshakati. At the end of that trip the preliminary results were presented at a workshop of the interviewees and other interested parties in Windhoek. The attendees were encouraged to comment on the results and also to apply a guide known as 'Readiness for the Networked World' to assess the state of ICT in Namibia.

The project team then returned to Sweden/South Africa and consolidated the information into a draft report, for submission to Sida.

Chapter One describes the study methodology in more detail and briefly examines African and international trends with particular reference to ICT initiatives in Sub-Saharan Africa.

Chapter Two deals with the socio-economic conditions in Namibia today.

Chapter Three examines the history and current status of the ICT Policy Development process in Namibia.

Connectivity and Access is covered in Chapter Four, beginning with an overview of provision of fixed line access within Namibia followed by an economic analysis of the performance of the Namibian Telecommunications Company. Compared with the performance of other telecom incumbents in the region, Telecom Namibia is a well-managed company, with a good financial situation and a success history of strong investments and having built a strong telecom infrastructure in the last decade.

There is one GSM mobile operator in Namibia, with over 150 000 users. The Government of Namibia and two Swedish investors own the company jointly. GSM coverage has expanded rapidly, and now covers about 65% of Namibia's population.

There are three major and several smaller Internet Service Providers in Namibia, and a number of Internet cafes in all major towns. The high cost of bandwidth places pressure on the quality of service available to customers, but there is evidence of strong demand in all major towns. There has been strong growth in the number of Namibian websites, most in English but many tourist sites are published in German.

Chapter Five covers Human Resources in Namibia, with particular reference to the 'education pipeline' from primary school through to secondary school and then on to further academic and vocational training. Schoolnet Namibia is an NGO initiative to assist all schools in Namibia to get access to computers and the Internet. Schoolnet has installed small networks in over 150 schools, and is building a wireless network to connect rural schools to the Internet. Schoolnet is in partnership with Sida, USAID and several Namibian private and public organisations.

In addition to these public institutions, there are several private firms offering computer training in Namibia,

Chapter Six deals with the Structure of the ICT Sector and Major Users in Namibia, excluding those companies dealt with in Chapter Four i.e. largely private business not exclusively focused on telecommunications. The ICT private sector is relatively advanced for instance with several large companies having invested in SAP installations.

The results of the Readiness for the Networked World assessment are given in this chapter.

The last chapter contains a summary and conclusions.

Chapter 1. Background

Sida supports the rapid integration of ICT in developing countries in order to improve communications and the exchange of information. It thus intends to expand its support to ICT related projects in partner countries in Africa and funds have been allocated for ICT pilot projects. The quantity and quality of information about the ICT situation in African countries, however, differs from country to country, and in general is limited and fragmented. Therefore Sida has taken the initiative to produce country ICT Surveys that should include information regarding key ratios, connectivity, access, the human resource situation, key institutions, and the policy and regulatory framework.

This report addresses Namibia, the fifth country surveyed under this programme.

1.1 Reason for Report

This current study sets out to:

- Gather information and make an assessment of the ICT situation in Namibia;
- Provide the results to Swedish embassies and units of Sida, as well as stakeholders in Namibia and the other countries concerned; and

1.2 Study Methods and Outcomes

The methods used to achieve the objectives of this study were straightforward. The project team used desk research to obtain background socio-economic information on Namibia, followed by the collection of previous ICT studies in Namibia in order to obtain readily available baseline data. In this regard the team was able to draw on its own previous participation in the 2000/2001 development of a draft ICT Policy for the Namibian Government. The country-specific information could then be placed in the context of African and global activity in ICT.

A local consultant in Windhoek was appointed to contact major stakeholders in ICT in the public and private sector and set up times for interviews. The interviews were used to:

- Supplement the available data gathered from existing surveys;
- Corroborate data already available;
- Ascertain priority implementation areas to leverage ICT rollout in Namibia; and
- Obtain other relevant publications such as vision statements, annual reports, brochures and publications, and to tap subjective opinions as to prospects for ICTs in the country. A two-person team conducted over thirty interviews, in some cases with multiple interviewees, of over an hour each.

The data that was obtained in this manner is summarised in the Appendices, and includes Key Ratios that relate to the Namibian economy, but with an emphasis on the ICT Sector.

Preliminary results are summarized in this report. We have also applied a current assessment tool known as the *"Readiness for the Networked World: A Guide for Developing Countries" to* assess the state of ICT in Namibia[1]. The same guide was applied about two years ago in Namibia's ICT policy report, and we are now able to compare the two years.

The Guide is intended to provide a rapid means of positioning Namibia against a fully prepared and networked country. It uses five categories of indicators:[2]

- ***Network Access*** – What is the availability, cost and quality of ICT networks, services and equipment?

[1] *www.readinessguide.org*
[2] Readiness for the Networked World: A Guide for Developing Countries: Centre for International Development at Harvard University, p7.

- ***Networked Learning*** – Does the educational system integrate ICTs into its processes to improve learning? Are there technical training programmers in the community who can train and prepare an ICT workforce?
- ***Networked Society*** – To what extent are individuals using information and communication technologies at work and in their personal lives? Are there significant opportunities available for those with ICT skills?
- ***Networked Economy*** – How are businesses and governments using information and communication technologies to interact with the public and with each other?
- ***Network Policy*** – To what extent does the ICT environment promote or hinder the growth of ICT adoption and use?

1.3 Brief Overview of African and International Trends

Since the mid-1990's the growth of the ICT industry, and in particular the Telecommunications sector, has been exceptional. Much of the growth has taken place in the developing world (emerging and least developed countries) and, for instance, has resulted in a significant increase in telephonic access for marginalised people.

1.3.1 International Developments

The worldwide collapse of stock markets and technology stocks in particular since 2001 has placed constraints on ICT growth as confidence in the economies of developed countries has dropped. It has become much more difficult, for example, to privatise fixed-line monopoly telecommunications operators at a reasonable price and many firms in the industry are showing losses or slow profit growth. Nevertheless, there remains consensus that the use of ICT is an important lubricant for the economy and that significant productivity gains can be achieved through judicious use of ICT in developing countries. Competition in important segments of the market remains fierce, and the dollar price of personal computers is still trending lower as a result of a significant oversupply situation. In 2001 sales of personal computers actually dropped by 4%, according to Gartner Dataquest, and new consumer machines in the USA are selling for around $300. Unfortunately, for many developing countries a significant weakening of their currencies took place at about the same time, thereby militating against this positive trend.

There is undoubtedly a huge increase of interest in the potential of ICT to fuel economic growth throughout the world. Developed countries are attempting to build on their competitive advantage by increasing the diffusion of ICT throughout their economies, whereas most developing countries are trying to move from an understanding of the potential benefits of the technology to realistic and achievable implementation schedules. The idea of being able to 'leapfrog' technological developments, while possible, is of little use to an economy where the fundamentals are unsound or where input factors such as skilled workers are in short supply.

The growth in the penetration of telecommunications, especially in developing countries, has been heartening. In 1991, total telephone penetration (fixed lines plus mobile phones per 100 people) in Least Developed Countries (LDCs) stood at 0.3, whereas by 2001 this had increased to 1.1.[3] However, the gap between LDCs and emerging nations grew in the same period, from 12:1 to 17:1.[4]

Mobile communications is responsible for a significant part of the growth in teledensity, particularly in Africa, where, since 2001, the whole of Southern Africa has had more mobile than fixed telephones.

The basic ingredients for reform of telecommunications markets are now well established: privatisation, competition, and independent regulation. At the beginning of 2002, more than half of the

[3] ITU, World Telecommunications Development Report 2002
[4] Ibid

countries in the world had completely or partially privatised their incumbent telecommunication operators, and even more had introduced competition through the licensing of private mobile operators.[5]

Also, there is increasing evidence to show that merely having telephonic access provides significant economic benefits to both the urban and rural poor, and therefore that while e-business and e-government will undoubtedly play a future role, the priority for governments should be coverage.

On a global level the United Nations strongly emphasises the potential of ICT and has launched projects such as a volunteer corps called the United Nations Information Technology Service ('UNITeS'), to train groups in developing countries in the uses and opportunities of the Internet and information technology; the Health InterNetwork, to establish 10,000 on-line sites in hospitals and clinics in developing countries and provide access to up-to-date medical information; and a disaster response initiative known as "First on the Ground," which will provide mobile and satellite telephones as well as microwave links for humanitarian relief workers in areas affected by natural disasters and emergencies. The World Bank's InfoDev programme funds large numbers of in-country ICT projects such as "e-readiness" assessments and e-government studies.

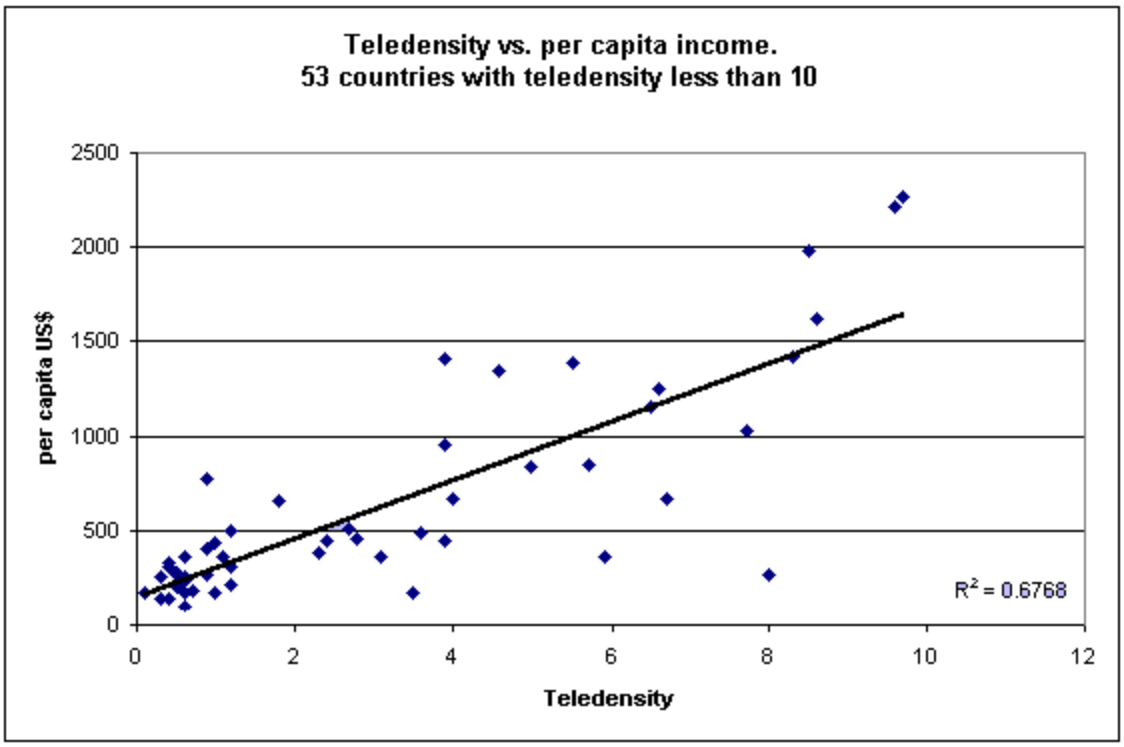
In July 2000 The group of G8 countries issued its Okinawa Charter on the Global Information Society, and passed a resolution to set up the Digital Opportunities Task Force (DOT Force) and tackle priority areas including fostering policy, regulatory and network readiness; improving connectivity, increasing access and lowering cost; building human capacity; and encouraging participation in global e-commerce networks. The conclusions of the work of the DOT force were presented in the Genoa Plan of Action, a nine-point plan endorsed by G8 leaders in 2001. The DOT force was transformed into the UNDP ICT Task Force in 2002.

1.3.2 Developments in Africa

One of the phenomena of our time has been the enthusiasm with which Africans have adopted cellphone technology. Clearly there is a pressing need to communicate, and the attraction of going from no telephonic communication to a mobile phone has provided a huge impetus to this industry. Pre-paid payment methods have fuelled the demand, and growth is still strong. The mobile segment of the market has been opened to competition in most markets (although Namibia is an interesting exception) and this has served to bring prices down.

Over the past few years, many African governments have privatised or are in the process of privatising their fixed-line telecommunications operator. In North Africa, for example, Morocco has been a conspicuous success story, going from the region's lowest telephony penetration to its highest through a combination of licensing mobile competition and selling off part of the incumbent operator.

[5] ITU, World Telecommunications Development Report, 2002



Teledensity is closely associated with per capita income. The above chart shows the relation between per capita income and teledensity (fixed and mobile) in 53 countries with low teledensity in 1999. The strong association suggests that it will continue to be difficult for the poorest countries to quickly improve their teledensity. Source: ITU World Telecom Indicators.

The Economic Commission for Africa launched its African Information Society Initiative (AISI) in 1996 and since then has been supporting several country projects to enhance National Information and Communications Infrastructures (NICIs).

An assessment of the achievements of Africa as a whole in progressing communications has been published by the United Nations after the second decade of the establishment of the United Nations Commission for Transport and Communications Development in Africa (UNTACDA).[6]

The Common Market for Eastern and Southern Africa (COMESA), of which Namibia is a member, has introduced various initiatives to stimulate trade within the region, including the formation of a Regional Payments and Settlement system linking central banks. In October 2000, the COMESA Free Trade Area (FTA) was launched, enabling the duty-free and quota-free trading on all goods originating within their territories. Namibia is one of the nine signatories to this agreement. In October 2001 the First Phase of the Air Transport liberalization plan, aimed at reducing protection and making regional airlines more competitive, ended. The COMESA Council of Ministers also recently adopted a programme for the stimulation of electronic commerce in the region.

[6] ibid

On 26th May 2000 COMTEL Communications was registered in Mauritius. It is a private limited company, formed by COMESA with the objective of establishing a regional telecommunications network covering all the COMESA countries. The COMTEL backbone network has been configured to include optic fibre, microwave and satellite connectivity.

On 27th of May 2002 the completion of the SAT-3/WASC/SAFE submarine cable system was announced, connecting Portugal and Spain in Europe to India and Malaysia in South East Asia via eleven 'drop-off' points along the route. This cable does not, however, serve East Africa.

Unfortunately the Africa One project, designed to circumscribe Africa with an optical fibre submarine cable intending to link to East Africa in Phase 3, and originally targeted for completion in 1999, has had financial and other difficulties and is unlikely to proceed.

The Southern African Development Community (SADC) is fostering information society initiatives within that region, including the signing of a telecommunications protocol and formation of a Telecommunications Regulators' Association for Southern Africa (TRASA). TRASA has fourteen members, including Namibia. Currently responsibility for the co-ordination of Telecommunications issues within SADC lies with the Southern African Transport and Communication Commission (SATCC) based in Maputo, but restructuring of the SADC Secretariat will soon lead to a Department of ICT reporting into the Deputy Executive Secretary in Gaberone, Botswana.

At the individual country level in Africa, South Africa has published long range scenarios for ICT, put in place an ICT Sector Development Framework, has promulgated the Electronic Communication Bill and is in the throes of telecommunications liberalisation as it considers applications for a Second Network Operator (SNO); As discussed in this report, Namibia is in the process of final adoption of its national ICT Policy; Mauritius is working through its National IT Strategy Plan and has promulgated e-commerce legislation; Senegal is pursuing a national ICT strategy and is noteworthy for widespread presence of phoneshops; Ghana has opened telecommunications to competition and privatised Ghana Telecom; Rwanda and Mozambique are implementing national ICT Policies and Tanzania is drafting its national ICT policy, noteworthy for the widespread participation of all significant stakeholder groups..

Given the worldwide "hype" surrounding electronic commerce, it is worth noting recent studies of the potential of e-commerce in Africa. They reveal very significant obstacles in many African countries to commerce in physical goods over the Internet—primitive banking systems, poor logistics systems and time-consuming customs formalities. This points to more promising areas for e-commerce such as off-line teleservices (Data capture, digitisation of architectural drawings), and on-line teleservices (Call Centres). It also encourages an emphasis on business-to-business transactions and government procurement over the Internet, rather than business-to-consumer activity.

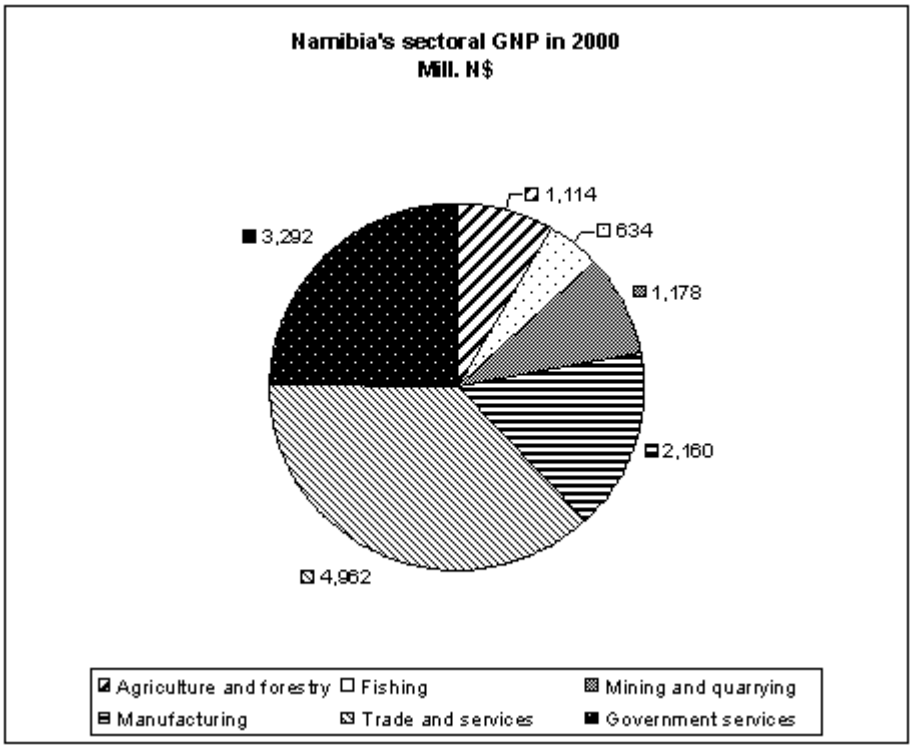
Chapter 2. Namibia Today

Namibia in one of the world's most sparsely populated countries. Only about 1.8 million people live in an area roughly the combined size of Sweden and Denmark.

In 1990, when South Africa left the country after many years of occupation, the SWAPO liberation movement won a significant majority in the country's first democratic elections. SWAPO's dominance was further secured at the elections of 1994 and 1998, but a vocal opposition holds about 25% of the seats in parliament. Political development has been characterized by the government's attempts to bring about national reconciliation after the years of apartheid, when white and black members of society had unequal rights.

Namibia's constitution is based on democratic principles, with separation of the legislative, judicial and executive powers of government. The country's independent media, in spite of its modest distribution and size, plays an important part in the scrutiny of the political system.

Namibia has a market-oriented economic policy in which private enterprise and foreign investment are encouraged. It has one of the highest per capita incomes in Sub-Saharan Africa (approx. US$1800 in 2000), but also one of the most uneven distributions of income. Sixty per cent of the population – mostly black and living in the northern rural areas - live in absolute poverty. Twenty per cent of the registered labour force is unemployed, and it is estimated that perhaps another forty per cent is underemployed.

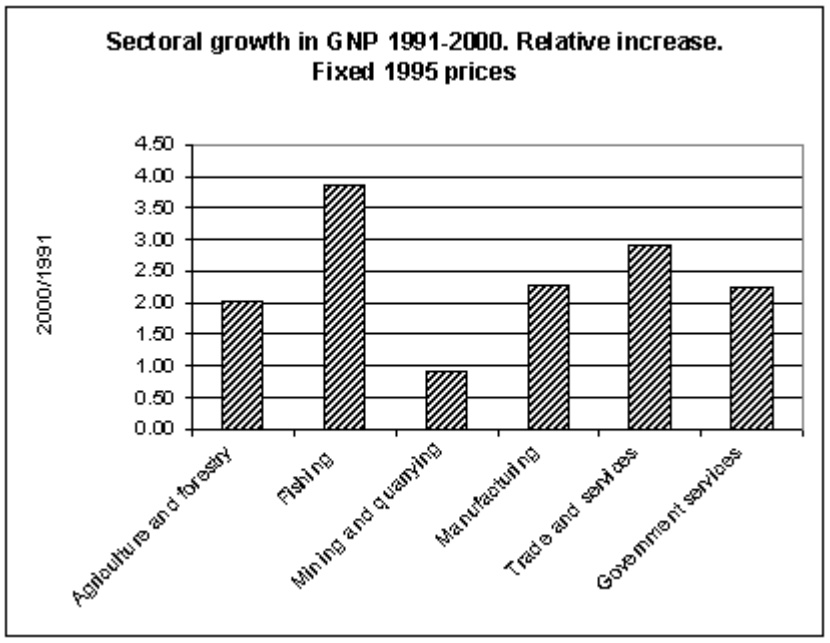


Namibia's GNP in millions of N$ by main sector in 2000. Source: Bank of Namibia.

The Namibian economy has changed considerably in the first decade of independence. In eleven years, dramatic improvements have taken place in the access to basic services for the black majority. Schools, rural roads, water, health care and public utilities have increased many times over

in a coordinated effort to give the majority access to these services. All sectors of the economy except mining have grown, but at very different rates. The following chart shows that mining is losing in importance, while fishing and all services have increased at a very fast rate. Commercial agriculture has seen only moderate growth, while output from traditional agriculture has tripled. These are the characteristics of a transition economy, and Namibia's modern sector is relatively dynamic.

The modern sector is dominated by a relatively small number of medium to large companies, many of which are run and managed like first world enterprises. Examples are Namibia Breweries, Namdeb, Rössing Uranium Mines, Nampower, Namwater, Telecom Namibia and the Olthaver and List Group. In recent years, a dynamic economic development process has started in the populous northern part of the country. Before independence, this area was very disadvantaged and development was inhibited by the South African regime. In the last ten years, substantial investments have been made in transport, power and telecom areas. A large number of schools and clinics have been built and private investments have greatly improved the supply of consumer goods and transport facilities. The area shows a remarkable economic vitality, and African entrepreneurship is visible everywhere. At the same time, a considerable part of the population in the northern part of the country relies on traditional subsistence agriculture, with a very low level of output in arid conditions. Population pressure and overgrazing have degraded the productivity of the land, and food production is inadequate. Grain can only be grown commercially in a small triangle with higher rainfall between Tsumeb, Otavi and Grootfontein. All land in this area is owned by a small number of (mainly white) commercial farmers.



Relative Sector growth. The value 1.0 indicates that no real growth took place over the decade. Source: Bank of Namibia

Namibia's has a relatively open trade and investment policy. Direct foreign investments are welcome in principle, but political statements often contradict the official policy by SWAPO's radical youth movement, and sometimes by statements from the head of state on various issues in relation to Namibia's colonial past. The official policy also tries to support previously disadvantaged groups to enter mainstream business, although there are no active affirmative action procedures

in place. Corruption is low on an African scale – Namibia scored number 28 in the world, with only Botswana of all African nations south of the Sahara[7] perceived as less corrupt.

Namibia is also facing a number of problems. The AIDS situation is deteriorating, with the same devastating demographic and social consequences as elsewhere in Africa. The delicate ecological balance poses another challenge. The shortage of water is a serious environmental problem in this country. There is little rainfall, evaporation is high, and there are few sources of water. At the same time, the very absence of water in the deserts of Namibia is a great attraction for tourists.

Table 1. Basic Socio-Economic Data on Namibia.

Indicator	Value
Population	1.8 million (2001)
Population Density	2.5 per square km
Population Growth	2.6 % average 1991-2001
GDP	US$ 3.2 billion (2000)
GNP per capita	US$ 1800 (2000)
Annual real GDP growth rate	3,3% (average 1996-2000)
Exports	US$ 1,100 million (f.o.b., 1999)
Export Commodities	Diamonds, minerals, manufactured goods, meat
Imports	US$ 1,241 million (c.i.f., 1999)
Structure of Economy	Services: 52% Industry: 15 % Mining 12 % Agriculture and fishing: 10 %
Foreign debt	1041 mill N$ (1999)
Foreign investment	895 mill N$ (1999)
Labour force	Agriculture 46%, Services 34 %, Industry 14%
Life Expectancy	44.7 years
Adult Literacy	82%
Gross Enrolment Rate 1997	78%
Human Development Index http://hdr.undp.org/reports/global/2002/en/indicator/indicator.cfm?File=cty_f_NAM.html	Human development index Life expectancy at birth (years), 2000 view 44.7 Adult literacy rate (% age 15 and above), 2000 view 82.0 Combined primary, secondary and tertiary gross enrolment ratio (%), 1999 view 78 GDP per capita (PPP$), 2000 view 6,431 Life expectancy index, 2000 view 0.33 Education index, 2000 view 0.81 GDP index, 2000 view 0.69 Human development index (HDI) value, 2000 view 0.610 GDP per capita (PPP US$) rank minus HDI rank, 2000 view -54

Sources: World Development Report 2000/2001. Central Statistical Office, CIA world fact book, UNDP HDI

[7] Transparency International; Corruptions Perceptions Index 2002.

Chapter 3. The ICT Policy Process in Namibia

Namibia has been engaged in ICT and telecom policy making and legislation since the early 90's. Events include:

1993 Tabling of IT Recommendations for Government.

1995 Proposals for an IT in Education Policy.

1996 Ministry for Information and Broadcasting adopts the ECA's framework for National Information and Communication Infrastructure (NICI).

1998 Workshop on "Development of a National Information and Communication Infrastructure for Namibia."

1999 Telecommunications Policy and Regulatory Framework for Namibia.

1999 October – Second NICI workshop recommends the formation of a broadly representative task force—subsequently termed the Resource Network Group (RNG)—to draft an ICT Policy by 2001.

2000 July – RNG issues a tender for preparation of a **Draft ICT Policy** Document.

2002 The Namibian Cabinet approves the draft ICT policy early in the year.

2002- November – Deputy Minister of Information and Broadcasting tables formal answers to questions raised. The policy document passes this reading. The Ministry must now produce a refined policy document for final adoption by Parliament.

While almost a year went by before there was any tangible progress on the draft policy, one recommendation occurred—disbanding the RNG. Also the combined Ministry of Foreign Affairs, Information and Broadcasting separated into two; the responsible Minister became the Prime Minister and Information and Broadcasting now reports directly to the President

Key recommendations in the Draft ICT Policy include:

Reconstitute the national ICT Commission

A multiple stakeholder high-level group to shape priorities and guide specific implementation strategies and plans.

Enhance rural access to information

The top priority. Comprises specific recommendations regarding creation of a universal service fund, achievement of universal access through multi-purpose telecentres and other public access points, subsidised Internet access etc.

Strengthen the ICT professional community

Recognises the shortage of specific advanced ICT skills, encourages easing of immigration visa processes, and recommends identification of ICT as a key profession in government.

Achieve excellent public ICT education

Urges updating and implementation of extant Schools Education Policy, rollout of SchoolNet programme in schools, alignment of university and polytechnic curricula with needs of business and government, and promotion of teacher training in ICT.

Foster ebusiness and egovernment

Focuses on status of existing government Intranet, desirability of eprocurement, and needs for policy and legislation facilitating ecommerce.

Liberalise the telecom environment

Recognises ongoing intentions to open the market to competition in fixed and mobile telephony and urges rapid implementation.

Create an ICT cluster in Windhoek

Recognises Windhoek as the hub of ICT activity in Namibia and encourages active networking of firms, industry bodies, financial companies, educational institutions, and government stakeholders to strengthen the sector.

Also a new **Communications Bill**, introduced by the Minister of Foreign Affairs, Information and Broadcasting, is going through the drafting process. Should the eventual telecom act contain the contents of the draft bill, it will reflect basic thrusts including: ensure fair competition and availability of telecom services to all users in the country, increase universal access and encourage private investment and innovation in telecom sector. It will result in

A new and stronger Communications Authority

The Minister sets policy, convenes a selection board and appoints the directors of the authority and the Chairman. The Authority is empowered to apply the dictates of the Act.

Prohibition of any anti-competitive practices

Includes prevention, restriction or distortion of competition, or abuse of a dominant position.

Number portability

A numbering plan requiring local number portability by all carriers within two years. Carriers must meet those obligations.

Mandated interconnection terms

Carriers must allow all others to interconnect with their networks at charges based on forward-looking incremental costs of providing such connections.

Separate licensing of telecom services for fixed terms including data and voice transmission services, national and international.

Could restrict a license to a category of users, or a geographic area, and require provision of universal service.

Mandated sharing of basic infrastructure

The incumbent telco and all other licensees are obliged to afford access to poles, ducts, conduits etc., and establish reciprocal compensation arrangements.

A Universal Service Fund

Operators may be required to contribute to such a fund that will be used to subsidise provision of universal service.

Rates and Tariffs

All operators must lodge rates and tariffs and be approved by the Authority in terms of rules laid down.

The telecom bill has been drafted with the SADC recommended model policy on telecommunications in mind, although the Namibian version is more broadly based, embracing aspects such as broadcasting and postal services.

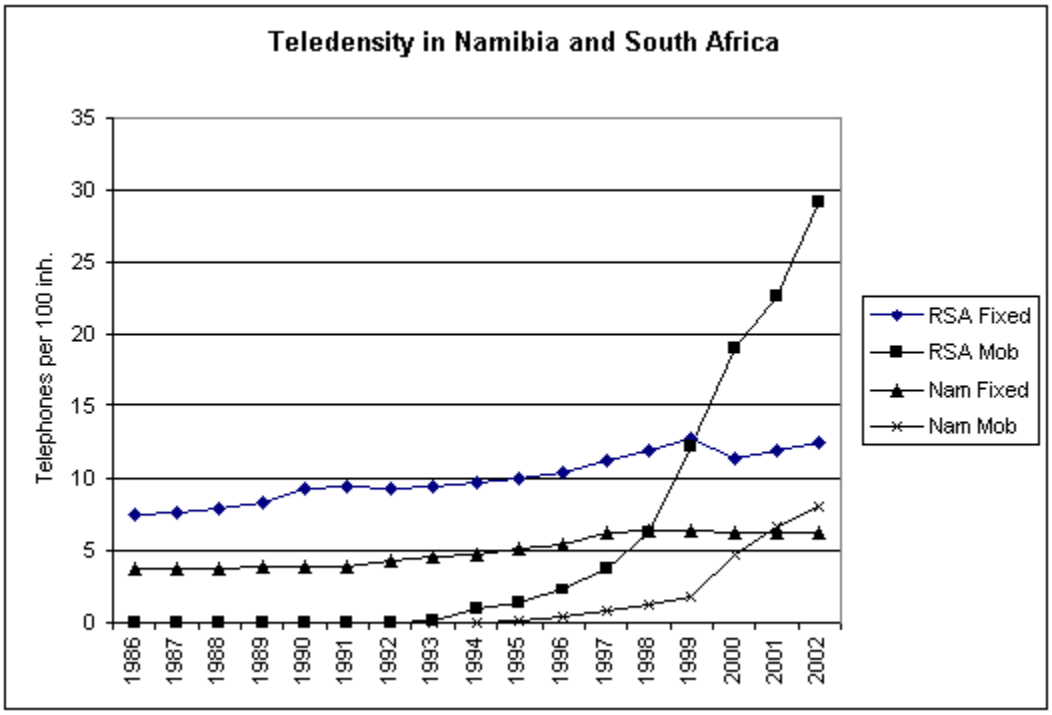
In summary, Namibia started engaging in ICT-related policy making and legislative processes several years ago. The process has generated several draft policies and bills addressing ICT in general and telecommunications in particular, but until recently there has been little translation of those activities into practice. This has maintained a level of uncertainty among stakeholders and has probably maintained telecom costs at an unnecessarily high level, slowed down the rollout of telecom into rural areas, and limited the diffusion of the Internet and ICT in the country. The early finalisation of a national ICT policy and acceptance of the Communication Bill as an Act of Parliament will likely result in much more rapid growth in the ICT sector.

Chapter 4. Connectivity and Access

4.1 Fixed Line Access

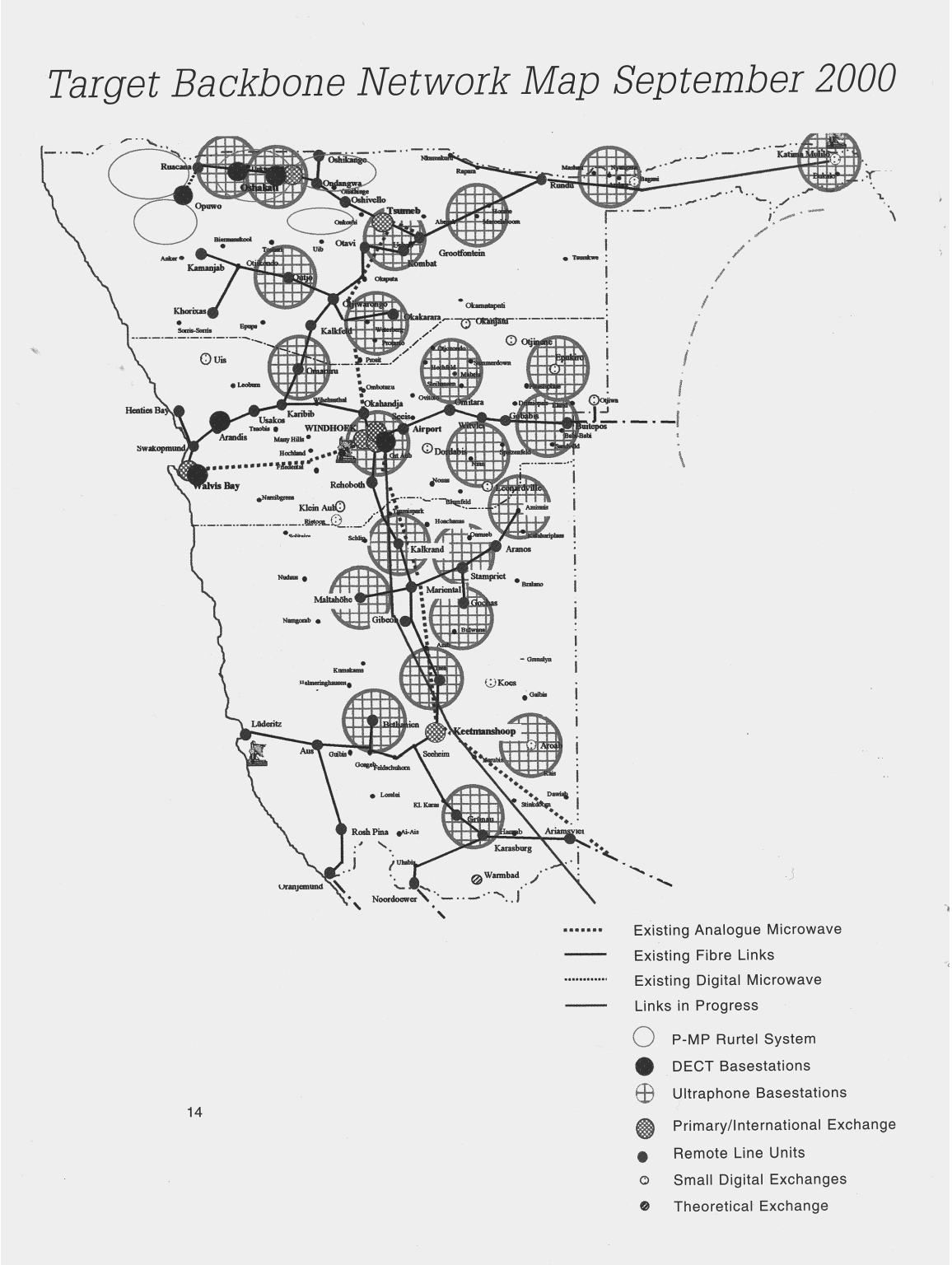
The installation of fixed lines (including wireless fixed lines) is the preserve of the monopoly operator, Telecom Namibia. The number of fixed lines has doubled since independence, from 57,000 in 1991 to about 117,000 in 2002. As a result, teledensity for fixed lines has increased from four to six lines per 100 inhabitants and total teledensity from four to 14. A wide network of well-maintained card phones has been established, in part due to an independent licensed operator known as Tele2 Publicon. Payphones have been installed across the country, particularly in areas with previously low telephone coverage. There are about 5000 payphones, 2.8 public phones per 1000 people.

The following chart shows the growth in teledensity for Namibia and South Africa, with separate series for fixed and mobile.



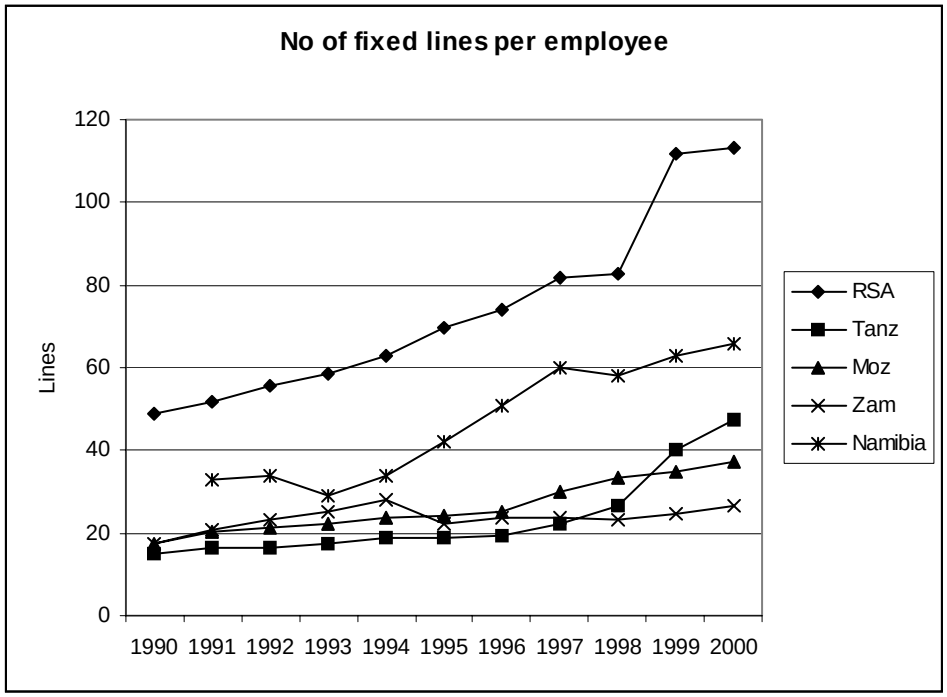
The rapid increase from about 1998 is mostly due to the introduction of mobile phones. The current geographical coverage of mobile telephone services is estimated at about 65% of Namibia's population.[8]

[8]Interview with MTC.



Namibia's fixed telecom network. Source: Telecom Namibia

A common indicator of a telecommunication company's efficiency is to look at the number of fixed lines per employee. The chart below shows the development of this indicator for five African operators between 1990 and 2000.[9]



As a result of introducing modern digital technology from the middle of the 1990's, all the countries except Zambia have dramatically improved their efficiency in the last few years.

4.1.1 Telecom tariffs

The following chart gives a comparison between telecom prices in Namibia and some other countries. All the African countries in the comparison have a monopoly for the fixed network, whereas Sweden has about thirty five competing resellers in the fixed network and about as many in the mobile networks.

Item	Namibia	Mozambique	South Africa	Sweden
Local: N$ per min/ US ¢ per min	0.33/3.3	3	3.3	1.5-3
National	6-10	23	8.8	1.5-3
To Mobile	16.5	32	18	15-55 (peak) 3-30 (off peak)
To RSA	22	60		55
To Region	22	60	18	4-9 (Europe)
To UK	86	207	34	4-9
To USA	86	207	36	4-9
64 kbps leased line (US$ per month)	300-500	400	68 (ADSL)	35 (ADSL, cable) 250 (VPN 512MB, LAN)

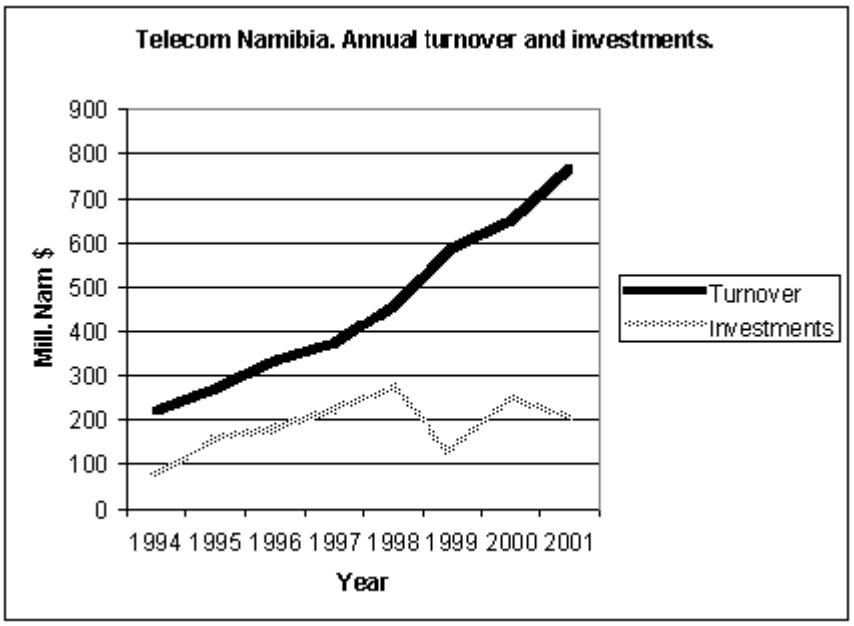
[9] ITU Telecommunications indicators database. Geneva 2002.

Rebalancing of tariffs started in 2000 with a considerable increase in local call charges and a reduction of national and international charges. The rebalancing process is expected to continue, but particularly international charges remain high in comparison with South Africa.

There seems to be insufficient competition in the area of Internet bandwidth. A 64 kbps leased line still costs about 400 US$ per month, and many customers complain about the poor performance of their leased lines. There are approximately 600 leased lines in the country, with UUnet having about 50% of the market. These lines share approximately six mbps of international bandwidth with 18,000 dial-up customers. The network is badly congested for much of the working day, and Internet browsing is often slow. It is claimed by some users that the leased line capacity is sold several times over as so-called Virtual Private Networks (VPN). Hopefully, the market will eventually take care of the situation, and more bandwidth of higher reliability and quality will be offered to Namibia's Internet users.

4.1.2 Telecom Namibia – a financial analysis 1994-2000

On the whole, Telecom Namibia has had a very healthy financial development since its formation in 1992. In the period 1995 to 2001, turnover has increased from 219 to 764 million N$ and the operating profit has never been below 13%. Investments total 1.5 billion N$ in current prices. When valued in 2001 prices[10] investments total 1.9 billion N$. The following charts highlight some of the most important data.

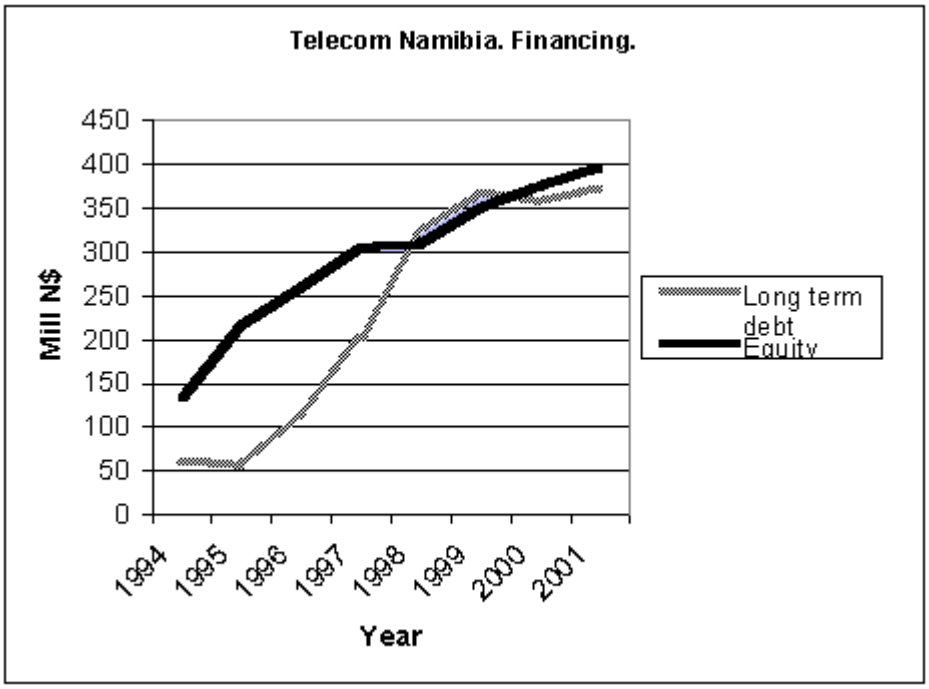


Source: Telecom Namibia Annual reports 1995-2001

After an initial period of rapid growth, investments levelled off at about 200 million dollars per year from 1997. As a result of the investment activities, the number of fixed lines has increased from 70,000 in 1994 to 117,000 in 2001, all exchanges are now automatic and digital, a large number of rural pay phones have been deployed and a high capacity fibre optic backbone has been installed throughout the country.

The financial position of Telecom has improved dramatically over the last eight years. The following chart shows the growth of equity capital and long-term debt in the last eight years. .

[10] Using the consumer price index as a basis for a deflator. Source: Bank of Namibia.



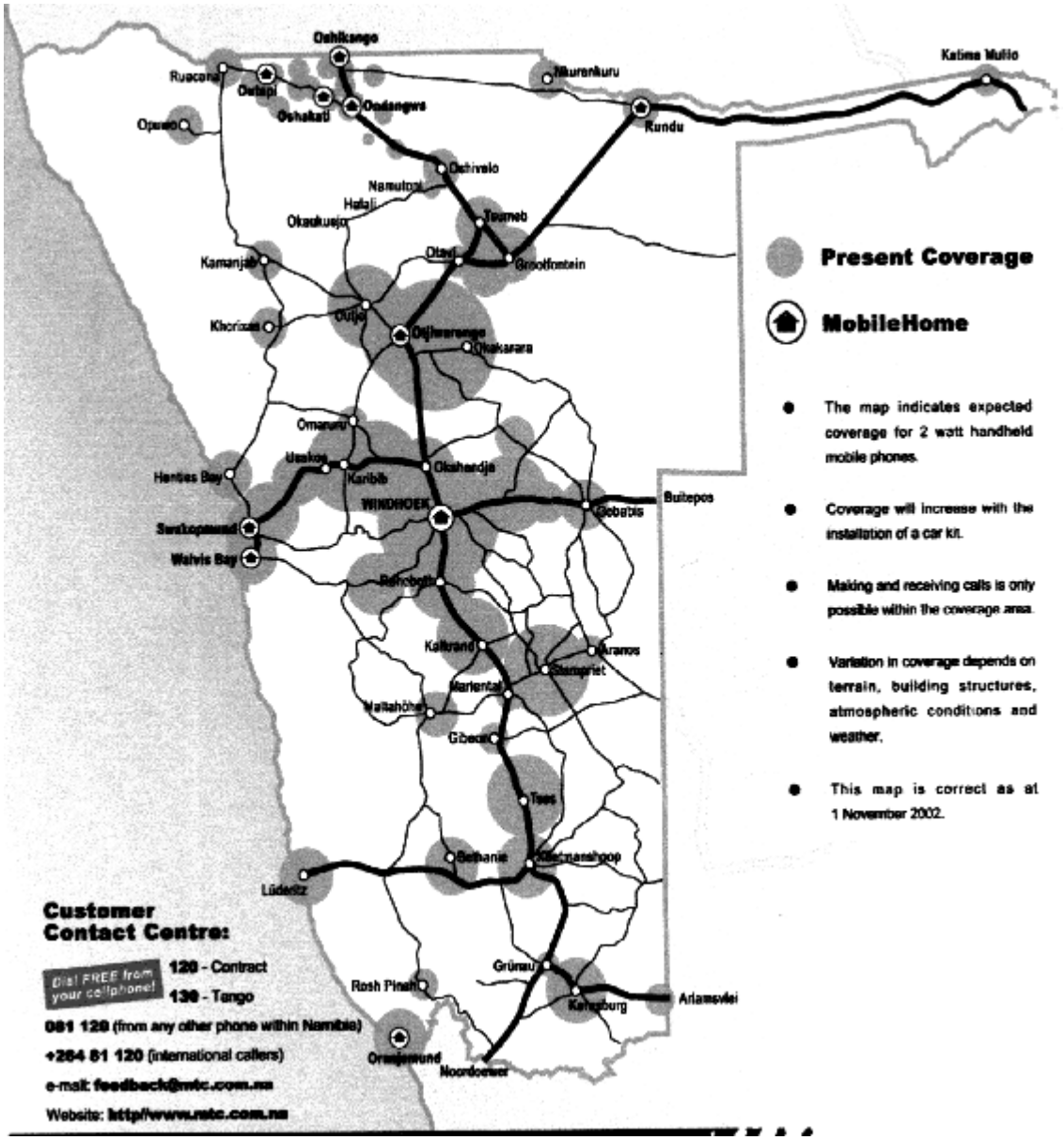
Source: Telecom Namibia Annual Reports 1995-2001.

4.2 Mobile (Cellular) Network

Mobile Telecommunications Limited (MTC) is a joint venture between Namibia Post and Telecommunications Holdings Limited, Swedfund International AB and Telia International AB and MTC officially started operating as Namibia's cellular service provider in April 1995.

MTC reached its 100 000 customer milestone in July 2001 and has two products to offer: MTC Contract and Tango, its prepaid cellular package. In November 2002 the number of customers was about 150 000, of which about 85% prepaid for their access. The number of active accounts is probably less because many prepaid accounts go dormant after not being renewed.

MTC's geographical coverage is shown in the map below. MTC has checked the coverage against census data, and estimates that about 65% of Namibia's population live within reach of a mobile signal.



Mobile telephone coverage in Namibia. Source MTC, Nov 2002.

The regulatory environment allows for a second mobile operator but no licence has yet been issued because it is only now that a licence application process is being designed.

MTC's tariffs can be seen in detail at www.mtc.com.na. Tariffs are slightly lower than in South Africa, both for contract and prepaid accounts. It is notoriously difficult to compare mobile tariffs, because of the almost infinite variation of monthly charges, peak and-off peak combinations etc. For example, the Comvik operator in Sweden offers per minute charges from 0.40 to 5.50 SEK per minute depending on contract type and time of day. MTC per minute charges vary from 0.65 to 2.24 N$ per minute, and Vodacom S.A. from 0.87 to 2.85 N$ per minute.

4.3 Internet Service Providers (ISPs)

See section 6.3.

Chapter 5. Human Resources

Based on estimates of numbers of computers, Internet subscriptions, leased line access etc., there are probably 150 000 computer users in Namibia. This number is set to grow as demand from the larger Namibian companies and the major firms and parastatals increases as well as through increased availability of public access points. This chapter describes several national programmes that aim to increase ICT capabilities of Namibians, such as Schoolnet, the recently announced Microsoft donation of computers to the Education Ministry, the University of Namibia's current strategic plan, progress at the Polytechnic of Namibia, work at the Namibian Institute for Educational Development, and growth in private sector ICT training offerings.

5.1 Primary and Secondary Schools

5.1.1 ICT Training In Schools

In Namibia, ICT training in schools is covered under four subjects:

Basic Information Science: For Grades 4-7, provides skills for retrieving and using information and distinguishing between information and knowledge; and developing skills on how to communicate information using a variety of media.

Computer Literacy: Outlines seven levels of basic competency that learners can achieve within their basic and secondary education.

Computer Practice: Taught in Grade 8-10. Provides vocational orientation in ICT and includes the basic architecture of computers and Spreadsheeting, Files, Desktop Publishing, Application Software, Hardware, Programming, Data Organization and the Internet.

Computer Studies: Usually undertaken after Computer Practice and examined both at IGCSE and HIGCSE levels (Cambridge Secondary and Higher Secondary Certificates respectively.) The content is similar to Computer Practice, but covered in greater depth, and adds Systems Analysis, Specification Design and Development.

Table 5.1 summarises the statistics for these subjects for the year 1998, the most recent data available.

Table 5.1 ICT related school subjects (source - EMIS, 1998)

Subject	Grades taught	Students taking the subject	Total number of students for the Grades	% of students taking the subject	% passing with A* or A	% passing with A* or A all subjects
Basic Information Science	Grades 4 - 7	3623	149 115	2.4 %		
	Grades 8 - 10	556	85 206	0.65 %		
Computer Literacy	Grades 4 - 7	233	149 115	0.15 %		
Computer Practice	Grades 8 - 10	2617	85 206	3.1 %	11.1 %	2.7 %
Computer Study	Grades 8 - 10	27	85 206	0.03 %		
	Grades 11 - 12	439	24 480	1.8 %	4.5 %	1.2 %

It is clear that the percentage of pupils taking computer related courses is very low. While there is no record available of teachers qualified in ICT-related subjects, this number can also be assumed to be very low.

5.1.2 Teacher Training

In 1995, the Ministry of Basic Education and Culture through the National Institute for Educational Development (NIED) developed a policy document for Information Technology in Education in Namibia. This valuable document set out the objectives for developing an ICT Policy in Education and expounded on key issues regarding the strengthening and exploitation of ICT courses in schools, including ICT utilisation. Unfortunately the policy was never implemented, but NIED has recently become more active in promoting ICT in schools. Researchers are carrying out specific studies and writing "stories" about the existing use of computers in schools and NIED is intending to formally include ICT subjects in teacher training from 2003. A number of donor funded projects will increase the number and quality of available IT resources in education institutions, and a number of expatriate staff are allocated to NIED to work with the development of e-learning. With regard to actual achievements, the most ambitious and successful schools ICT project in Namibia, however, is Schoolnet, described in the next section.

5.1.3 Schoolnet Namibia

Schoolnet is an association with membership open to individuals, corporations and institutions with an interest in information technology and its application in the field of education. It was started on a modest scale in 1999, and began to receive financial support from Sida in 2001. Below follows an extract from Schoolnet's Constitution:

- *2.3 to explore and implement creative ways of ensuring the sustainability of school networking activities, low-cost and appropriate solutions that extend the democratisation of access, especially to rural areas.*
- *2.4 to develop local applications and educational content, and encourage the critical role of ICT champions and mechanisms to ensure sustainability;*
- *2.5 to monitor and evaluate the impact of the use of ICTs on education, increase awareness and understanding of the potential of ICTs in education, share information on best practices in school networking and in developing partnerships, and to encourage relationships and build trust among the key players that enable such networking.*

Schoolnet's members come from all parts of Namibia's public and private lives. The organisation is in the process of expanding its activities to a large number of schools in Namibia. The general idea is to connect as many schools as possible in the rural areas to the Internet and Schoolnet, using volunteers as trainers and facilitators in installing and starting up computer and communication facilities. Behind all this is the idea that schools are particularly well suited to become hosts for rural information and communication centres, and that teachers and students jointly assume the role of facilitating the provision of information in their societies.

By November 2002, about 160 schools had been connected by Schoolnet, with about 2000 installed computers. All computers have been donated to Schoolnet by Namibian companies and organisations, or through international NGOs.[11] Most schools have a Linux server connecting a varying number of PCs in a Local Area Network. At present, in most cases the Internet connection is via dial-up telephone modems, but this solution is proving too expensive for most schools and Internet performance is also too slow for realistic access to the web. In the last year, a wireless network solution[12] has been tested, and it is now being installed in the Ondangwa/Oshakati area, partly with Sida financing. The wireless solution will dramatically improve performance and lower the costs of connection.

For schools without electricity, Sida has provided money for the installation of solar power in about seventy-five schools. A solar power solution has been selected and tested by Schoolnet for a year, and installation starts in November-December 2002. Schoolnet, USAID, NIED (Namibian Institute for Education Development), Sida and the US Peace Corps are planning a joint initiative

[11] Computer Aid International and World Computer Exchange.
[12] The technology is called BREEZEAccess from Alvarion. See www.alvarion.com for a description of the technology.

that will add substantial resources for the expansion of Schoolnet to more rural schools, as well as supplying ICT skills to a large number of Namibian teachers.

Schoolnet is a rapidly growing organisation. According to its plans, another hundred schools and a substantial number of computers will be deployed in the next twelve months. This presents a big logistic and management challenge for an NGO that relies primarily on voluntary human resources. Even if the rate of growth has to slow down, it is still a remarkable achievement, as evidenced by the recent award to Schoolnet of the APC's Nancy Hafkin prize for effective ICT applications in Africa.

With increasing volumes, Schoolnet will face a growing demand for support and maintenance from the schools, and more resources will be needed for the management of its business.

Schoolnet's radio data network will grow to thirty base stations, covering several hundred schools in the densely populated areas of northern Namibia. The network already has capacity for voice communication using voice over Internet (VOIP) technology. Existing legislation and Telecom Namibia's business policies prohibit voice from being used, but as mentioned in the previous chapter new telecom legislation is now underway that may enable VOIP.

5.2 Colleges and Universities

There are two main tertiary institutions in Namibia: the University of Namibia and the Polytechnic of Namibia. In addition to those, there are seven Vocational Training Centres (VTCs), four Colleges of Education, three Agricultural Colleges and one Police Training College. There are also parastatals such as NAMCOL (Namibian College of Open Learning) and Private Colleges like Damelin and the Higher Education Institute, which offer a variety of programmes in collaboration with external institutions.

5.2.1 University of Namibia

The University of Namibia (UNAM) has 690 staff, 5000 fulltime and 4000 distance students, the latter mainly located in the Oshakati region. It has three full-time programmes relating to ICT:

Computer Science, which has a heavy emphasis on programming, database management and networking and is offered as one of two majors in the BSc "double" degree.
Information Studies, which combines Library Science and Information Technology.
Journalism, which covers courses in news reporting, publishing and other aspects of the media, and also concentrates on Desktop Publishing and Graphics Design.

Recently announced is a taught Masters Degree in Information Technology, to commence in 2003. There are also plans to start part-time degree programmes in Computer Engineering, as well as professional programmes such as A+, MCSE, E-Commerce, etc. The Table below shows enrolment figures for various ICT-related courses.

Table 5.2 ENROLMENT IN UNIVERSITY OF NAMIBIA ICT RELATED SUBJECTS

	1999				2000				2001			
	YEAR OF STUDY				YEAR OF STUDY				YEAR OF STUDY			
	1	2	3	4	1	2	3	4	1	2	3	4
Information Studies[1]	-	-	-	-	43	-	-	-	206	24	-	-
Library Info. Studies[2]					3	1	3	2	9	4	2	3
Computer Science (BSc)	88	23	16	6	72	54	21	23	79	76	22	11
Computer Literacy [3]	580				587				725			

[1]The Course was started in year 2000; [2]Statistics for 1999 are not available; [3]This is a one-year Course offered to all interested students

UNAM has a Computer Centre serving the needs of its staff and students. The campus LAN comprises a 2Gb backbone connecting some 1200 computers and 100 printers on campus and linking to two other campuses and nine regional centres. Recently a new library building was constructed and houses UNAM's Information and Learning Resource Centre. This ILRC has a sophisticated network of computers with Internet access, access to CD-ROM-based academic materials, the Internet, and an Interactive Multimedia Services unit.

A draft ICT strategy for the university is in circulation and promises to underpin a comprehensive set of plans covering ICT in education and research, administration and management, provision of ICT services, and library services. It also addresses a strategy for the Northern campus in Oshakati and the regional centres.

5.2.2 The Polytechnic of Namibia

he Polytechnic of Namibia

The Polytechnic of Namibia offers Certificates, Diploma and B Tech Degrees. With regards to ICT Courses, the Polytechnic offers a variety of Programmes. For a long time the Polytechnic has been offering a National Diploma in Business Computing, which has been highly applauded by the industry. This Diploma, which was started in collaboration with the industry, has been modified and is continuing in its updated form. The Polytechnic has also introduced two additional Diplomas: National Diploma in Information Systems Administration, and National Diploma in Software Engineering. In addition to these the Polytechnic is introducing a Bachelors degree (B Tech) in Information Technology this year, 2003. These programmes are modular, allowing a student to start with a Certificate, proceed to a Diploma and finally obtain a Degree. Computer Literacy or Computer User Skills is taught to all Polytechnic students. The Polytechnic also offers a number of ICT programmes and ICT short courses to the Public. Table 8.3 gives enrolment figures for the year 2000.

Table 8.3.1 ENROLMENT IN POLYTECHNIC ICT RELATED COURSES IN 2000

	YEAR		
	1	2	3
Certificate in Information Technology	72	-	-
Diploma in Business Computing	10	27	14
National Diploma in Info Systems and Admin*	-	-	-
National Diploma in Software Engineering*	-	-	-

Course not offered before year 2001

Table 8.3.2 ENROLMENT IN POLYTECHNIC ICT RELATED COURSES IN 2002

	YEAR	
	1	2 & 3
Certificate in Information Technology	160	-
Diploma in Business Computing	-	75
National Diploma in Info Systems and Admin	-	45
National Diploma in Software Engineering	-	40

At the tertiary level, both the University and Polytechnic of Namibia have good computer networks that can be effectively used for on-line Internet-based courses as well as courses using other ICT-delivery modes. In addition, both the University and Polytechnic have more than eight Campuses around the country that can be used as centres for delivery of various on-line courses. Currently most course materials use only print media. The University, however, has launched a Video Conferencing facility between the Main Campus and its Oshakati Campus. This facility is used for both meetings and teaching, and has significantly reduced the cost of transport of staff and lectures respectively. Efforts are still underway to train lecturers to ensure the best use of this technology for effective teaching.

The University has about 1240 students on distance learning while the Polytechnic has 1300 students. Syllabuses, course materials and assignments are run using traditional course guides in printed form. A great deal of benefit can be derived if these programs can begin to use CD-ROMs with Hyperlinks, E-mails, list servers and Bulletin Boards.

5.2.3 Other Institutions

Namibian College of Open Learning (NAMCOL)

NAMCOL is a recently formed College which according to its Act, is mandated to provide "opportunities for adults and out-of-school youths to upgrade their professional and vocational skills" through "the use of modern instructional techniques, including, but not limited to, the media, and utilisation of technological equipment." NAMCOL offers an Alternative Secondary Education Programme for out-of-school learners at Grade 10 and Grade 12 levels. It is also empowered to make tertiary-level awards and is currently offering tertiary-level programmes. In terms of enrolment statistics, NAMCOL is the largest educational institution in the country. NAMCOL has recently established a Computer-Based Learning Centre (CBLC) that is offering a variety of ICT related courses. The overall student enrolment figures for NAMCOL are given below.

Table 5.4 NAMCOL ENROLMENT FIGURES FOR 1997-2000

	1997	1998	1999	2000
Distance Education	8443	9707	10263	10966
Face-to-Face Mode	8197	10311	11040	12352
TOTAL	16640	20167	21303	23318

Private Training Institutions

There is a growing number of private institutions offering industry-related training, such as SAP training, MCSE, CNE, ICDL, etc.

Chapter 6. ICT Sector Supply, Usage and eReadiness

6.1 Introduction

As a consequence of the lengthy rule by South Africa, the development of the ICT industry in Namibia mirrored developments in its larger neighbour for many years. This reflects in the commentary below, although it is clear that Namibia now boasts an independent and sophisticated telecom infrastructure and growing adoption of ICT and Internet facilities in both the private and public sector. The ereadiness estimates presented later in the chapter show one of the countries in Africa most prepared for the Information Era.

6.2 Supply of ICT

Computing Hardware, Software and Services

Industry estimates put the total number of PCs in Namibia at 25 000 with sales of 6000-7000 per annum. At present no hardware is manufactured in Namibia and little tailor-made software development takes place in the country. The ICT Industry has standardized on generic software products such as the Microsoft range, with a small Novell and Unix installed base.

All hardware is imported from international sources, with the main supplier being South Africa. Most South African companies consider Namibia to be part of their distribution channel and are reluctant to open offices in Namibia because of the size of the local market. Until recently the largest distributor in Namibia was Siltek Distribution Dynamics, a South African based company. That company went bankrupt and since then almost all distribution is via direct marketing. This is currently taking place through companies such as Dell Direct (with a local partner), ICL via their local partner and IBM via their local channel partner.

In 2000 sales revenue for the total distribution channel was N$150 million. Revenue expected for 2001 was +/- N$130 million for the total industry. Namibia's ICT industry began to grow quickly in the early nineties. According to industry insiders there are about 170 computer companies in Windhoek alone, and well over 200 in the country as a whole.

The ICT industrial sector has shaped itself around a few key companies that are able to provide support to the market place. These companies include:

- AST Namibia: an SA-based company with a local office that provides software development, consultancy services, and networking.
- ORBIT Data Systems: a fully owned Namibian company that provides hardware, and specialised software support.
- Comparex Namibia: an SA-based company with a local office that provides hardware, software development, and networking.
- Schoemans Office Systems; a fully owned Namibian company that has been in existence for the longest period in Namibia, providing hardware, software, software development, consultancy, system integration, project management, networking, and technical support.
- UNISYS Namibia; an SA-based company with a local office that provides hardware, software, and technical support.

6.3 Internet Services

Internet Commercial Services were established in Namibia late 1995/early 1996. Since then Namibia has seen the introduction of several ISP's into the market. All ISP's operate on top of the telecom communication backbone established for the whole country. Connection out of the country is provided to the ISP's via Telecom.

Structure of Sector

Recently Telecom established Infinitum, a wholly-owned subsidiary "wholesaler" of bandwidth. Infinitum has aggressively entered the corporate leased line and virtual private network market as well as providing access to ISPs. There are four major ISP's in Namibia, and two smaller ones. The large ones are listed below.

- UUNET Namibia: UUNET is part of UUNET Technologies Inc. Their backbone with 4mbps international capacity via South Africa is purchased from Telecom and is resold to their clients. The company is mainly company network focused and supplies bandwidth and services to about 300 points in the corporate market in Namibia.
- Africa On-line: Supplier of dial-up and leased line connectivity but mainly focused on non-leased line clients, providing users with access primarily to email.
- Mweb: Supplier of dialup and a few leased line connections to their clients via the Internet. Additional services include Web hosting, domain registrations, and email access.
- IWAY: The newest addition to the group of local ISP's is the result of a United Nations Project (UNOPS) to allow for the spreading of Internet facilities within the Republic of Namibia. IWAY is a fully owned subsidiary of Telecom Namibia. They rent services from Telecom Namibia and have grown rapidly over the last two years.

There are also smaller ISP's including NamibNet and Cyberhost.

The ISP's have provided figures that suggest total annual revenues to the industry of N$45 million in 2001.

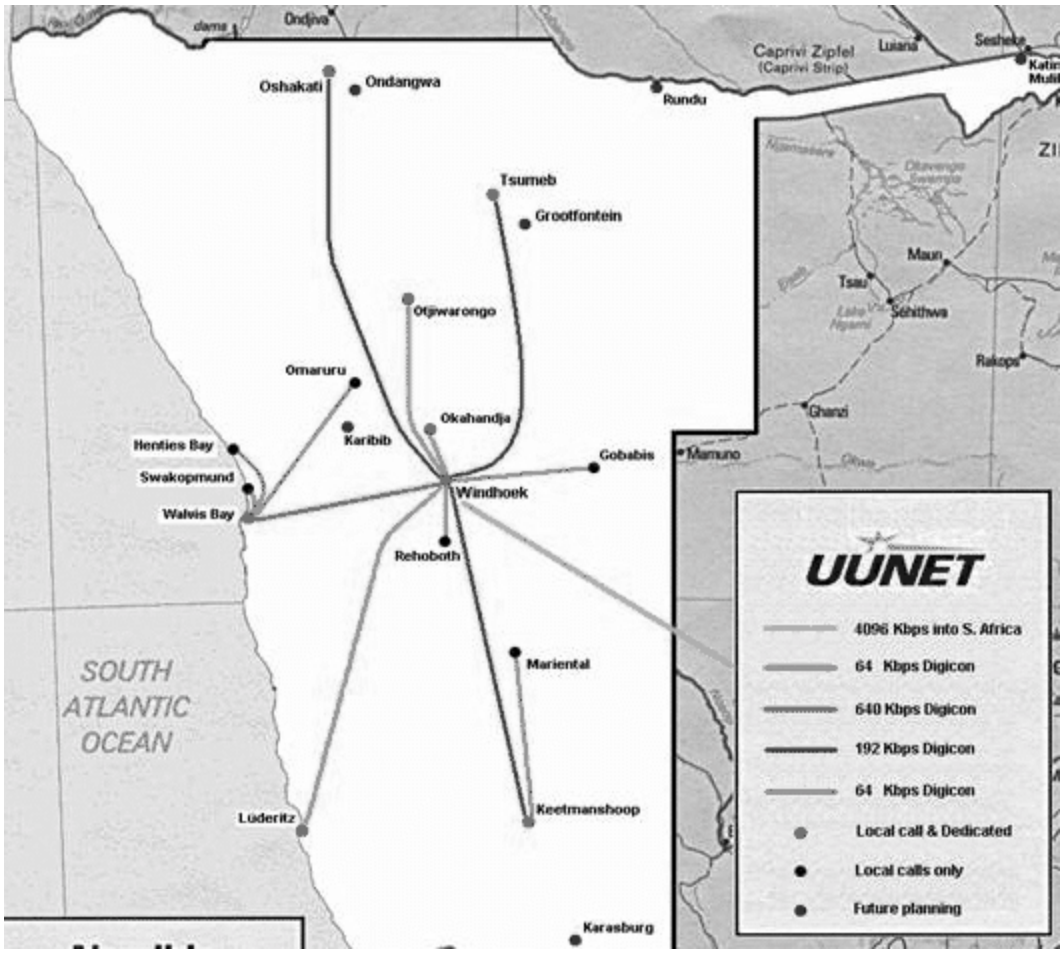
As regards international bandwidth, Telecom has 2mb up and 6mb down via satellite and UUNET has a 4mb fibre link to South Africa. All ISPs obtain their connectivity from these sources. Recently Telecom and UUNET entered into a peering arrangement, which is saving several hundred kbps of unnecessary international traffic. The diagram below shows the installed network of UUNET Namibia, the Internet company with the greatest coverage in the country.

As regards public access points to the Internet, despite special surveys of multi-purpose community centre (MPCC) potential in the country, official overseas study tours, etc., and government's stated intentions to roll out at least one MPCC in each of the thirteen regions in the country by 2004, none has yet surfaced. What is noticeable, however, is the emergence of Internet cafes. There are several in Windhoek and other towns in Namibia, including one in central Windhoek that has forty five seats and is billed as the largest in Africa.

The Corporate (leased-line and VPN) market includes multinational companies with local presence, most of government and many medium to large Namibian organisations. It is estimated to comprise some 15000 to 20000 active workstations.

Government, via the Office of the Prime Minister (OPM) operates as an ISP in the support of Government ministries/offices, which are obliged to use their services. The estimated total number of government users is 2000. Because of slow access speeds and unsatisfactory service, government departments are beginning to seek Internet services from the private sector. This is achieved by holding dual accounts, with the OPM and with a private ISP.

Other (dial-up) users of the Internet are estimated to amount to 18000, including small business, home users and an increasing number of schools.



6.4 Demand for ICT

So far we have described the "supply" side for ICT in Namibia and covered telecommunications equipment and services, the Internet sector and the ICT Industry structure. Now we assess the "demand" side. Who uses the products and services provided, to what extent and in what ways?

Government

The government IT budget in 2001 was stated as N$ 27.6 million. To serve its 80000 employees it has some 5000 computers (including laptops) with 3500 in Windhoek alone. Most offices and Ministries have Local Area Networks (LANS), comprising about 50 LAN servers of an assortment of types. Government has standardised on the Microsoft range of products, but Lotus Notes and other related products are also used. There is some presence of Unix, Linux and Novell, but this is minimal.

Internet links are provided to each ministry, and in some cases directly to directorates and departments. From those points services are distributed to the people connected to the network. There are approximately 2000 Internet users with email accounts.

Government has a Department of Information Technology within the Office of the Prime Minister. At present, there are about twenty members of staff within this Directorate, but it is running at 50% of its stated establishment. The following ministries have fully operational IT units under their control.

- Ministry of Agriculture, Water Affairs and Rural Development
- Ministry of Works, Transport and Communication

- Ministry of Trade and Industry
- Ministry of Education (both Higher and Basic)
- National Planning Commission

Some of these ministries have become more or less autonomous in their ICT activities with the central group servicing the smaller ministries with ICT.

Business (including Parastatals)

After Fishing and Government, Manufacturing and Mining remain the largest sectors in the Namibian economy, although Trade and Services grow most rapidly. The following sections briefly examine the Manufacturing, Mining and Finance sectors, for which some ICT data has been obtained. Many local corporates are effectively branch offices of South African companies and much of the control and processing of information takes place there.

Manufacturing

This includes meat, fish and other food processing. The larger and more important companies in this sector include Namib Mills with three different milling facilities and ten depots around the country, Namibia Breweries Ltd., and the Sonnex Group which manufactures paints, bricks, paving and concrete walls and imports and distributes products including earth-moving equipment and motor vehicles. The sector employs about 700 people and uses 200 PCs. Namibian Breweries in particular has a state of the art process controlled brewing plant and exports 50% of its production, but interestingly has few Internet-based activities such as order processing and distribution.

Mining and Quarrying.

Included here are diamond and uranium mining, as well as petroleum exploration. Prominent companies include:

- Namdeb Diamond Corporation: employing over 3200 people. Namdeb built the town of Oranjemund, which currently houses 10000 people.
- Rössing Uranium, The fourth largest uranium producer in the world employing over 1100 people. Rössing invests heavily in Technology and is a significant user of Enterprise Resource Management programmes (SAP/3). The operations at Rössing have been downscaled in the last five years.
- Namco: An independent marine diamond company.
- Scorpion and Rosh Pinah Zinc mines near the Orange River are two new developments in the mining sector that will provide a welcome addition to employment and exports.

This sector employs some 12 300 people and uses about 3000 PCs. It is the most developed sector with regard to ICT and all staff members who require access to computer systems have a PC available to them. State of the art equipment has been installed. Internet usage is very high with email being used extensively. There are communications links to South African mining operations.

Banking

Namibia has a sophisticated banking system, with a large network of about 150 Automatic Teller Machines installed throughout the country. The banks support and issue most major credit cards and are linked to major international communication networks such as SWIFT. Banking over the Internet has been introduced in Namibia.

The major banks represented in Namibia are:

- Bank Windhoek: Bank Windhoek currently maintains 21 branches, twelve service points and 41 ATM's around Namibia.

- City Savings and Investment Bank (CSIB): targets the previously disadvantaged communities. CSIB has five branches in Windhoek and Northern Namibia.
- First National Bank of Namibia: FNB Namibia has the largest banking network in the country, with 26 branches, two sub-branches, ten agencies, two mobile agencies and 71 Automatic Teller Machines (ATM's)
- Standard Bank Namibia: a subsidiary of Standard Bank of South Africa. Has a network of 19 branches and 19 agencies across Namibia.
- Commercial Bank of Namibia: concentrates on the corporate market and the upper end of the commercial market.

The banks that are closely associated with South African banks are all linked into their networks and systems, which are largely mainframe-based. The individual banking ATM networks in Namibia are linked to each other and also to South Africa, so that access to a bank account can be effected from any terminal. There are an estimated 1700-plus PC's installed within the sector.

The Central Bank of Namibia is extensively computerised. A fully automatic clearing system was introduced in 2001, and the BoN web site is currently the best source for financial and economic data about Namibia on the web.

Transport and Communications

Prominent companies in this sector include:

- Air Namibia, a private company with the Government of Namibia as the sole shareholder. Air Namibia is a full member of IATA and SITA (the airlines global communications network). It participates in various computerised reservation systems such as Amadeus, Sabre and Galileo.
- Maersk Namibia, a shipping company, with eight modern vessels and over 400 000 containers to serve Namibia
- Transnamib Holdings, a private company with the Government as sole shareholder, operating rail and road transport. Subsidiaries include Namrail, TransNamibia Travel and the Namibian Ports Authority. Transnamib owns an extensive fibre and microwave communications network that it uses for internal communications throughout Namibia. Its internal computer systems are out of date, however, and the subject of an extensive plan to refurbish and upgrade.
- The Walvis Bay Corridor Group. The primary aim of the Walvis Bay Corridor Group is to foster reciprocal trade with Namibia's eastern neighbours, using the Port of Walvis Bay as the loading and discharging point for sea traffic, mainly container goods. Large investments in handling capacity include a considerable IT component for cargo handling and documentation.

Power Utility

Nampower is the monopoly provider of electricity to Namibia. It has a sophisticated internal computer set-up and also an extensive fibre network for communications extending across the border into South Africa. Recently it established a subsidiary, Power.com, apparently preparing for a role in telecom once competition is allowed.

Tourism

Official statistics are not maintained on the Tourism Industry per se, but rather on individual components such as Hotels and Restaurants. Tourism is currently the fastest growing industry in the world and in line with this the Hotel and Restaurant sector showed a CAGR in real terms of 45% from 1993 to 1997. Namibia has a well-developed infrastructure to accommodate tourists, including urban hotels, game parks and a burgeoning bed-and-breakfast sector. Some 170 establishments large and small can be found on the Internet, although fully-fledged ecommerce is not yet possible.

6.5 Websites

The Namibian country top-level domain and several sub-domains are administered by a medical practitioner now located in Oshakati. Under his administration some 4000 .na hosts have been registered. This is a small number relative to other Internet statistics in Namibia and for instance represents a much smaller ratio of hosts to population than neighbouring South Africa, which has some 250000 .za hosts. It is not known how many Namibian entities have chosen to register with .com or other top-level domains.

Several people in Namibia noted their serious concerns about the administration of the .na domain and indicated that ICANN might soon be approached to support a change of domain administration.

Internet searches of course reveal a large number of Namibian websites. The most visited more or less in order include:

www.namibian.com.na/ The Namibian Newspaper

www.unam.na/ University of Namibia

www.natmus.cul.na/ National Museum of Namibia

www.economist.com.na/ Namibia Economist

www.mtc.com.na/ Mobile Telecommunications Company

www.schoolnet.na/ Schoolnet Namibia

www.grnnet.gov.na/ Government of the Republic of Namibia

www.nepru.org.na/ Namibian Economic Policy Research Unit

www.namibiatours.com.na/ Namibian Tours

www.cif.namibia.na/ The Construction Industries Federation of Namibia

A potentially very valuable website is www.gatewaynamibia.org.na. It is the site sponsored by the World Bank Development Gateway Foundation and is intended to be a country portal comprising information related to all development activity in Namibia. So far there is little content on the site and the portal seems to be taking a long time to gain acceptance by information providers.

6.6 Readiness for the Networked World

As is the case in most SADC countries, in Namibia there is currently little evidence of 'new economy' products and services such as electronic commerce, distance learning, multi-media, etc. Such aspects result from a complex of factors, many of which are not directly technology-related, but which combine to make a country 'ready' for the new economy. The ability of a country or region to participate in this 'Networked World' has received much attention over the past few years, and various models have been developed to try to assess the state of a country to participate in this development.

The consultants reviewed the ereadiness parameters for Namibia originally estimated during the 2000/2001 ICT Policy process. At the feedback workshop held in Windhoek towards the end of the field visit to Namibia, the participants ratified these numbers with some minor adjustments. The averaged results are shown in the Table that follows.

Note that the ratings are on a scale of 1 to 4, where 1= unprepared and 4= fully prepared. In the assessment guide, suggested values for the Key Performance Indicators are contained in the text e.g. to be rated a '4' or fully prepared in the Information Infrastructure aspect, Teledensity would need to be 40+ mainlines per hundred people and mobile penetration would be 14% of the population or more.

Since this assessment guide was published, the pace of change has increased, so that the 'hurdle' of moving up a category is probably lower than it should be. The assessment guide should be

used in conjunction with other information about Namibia, since it uses a very broad classification.

Most of the more sophisticated applications that will allow local business to become internationally competitive are not in evidence. The lack of business-to-business applications and the corresponding lack of e-Government programmes represent a barrier to progress that must be addressed.

The lack of ICT in Education particularly in primary and secondary schools represents an opportunity. Trying to improve the learning environment without the use of ICT, given the legacy of under-funding within education, provides seemingly insurmountable obstacles. ICT does have a leverage effect that could be exploited in a well-conceived programme.

Aspect/Category	Key Performance Indicators	Rating	Comments
Network Access			
Information Infrastructure	Teledensity Mobile Penetration	2/3	Teledensity and mobile phone usage continue to increase, with mobile units passing fixed lines in 2001. Growth is not as rapid as in other African countries, however, probably due to lack of competition, but also the small dispersed population of Namibia.
Internet Availability	Inhabitants/ISP Public Internet Access Competitive leased Line Providers Connection Reliability	3/3	There is healthy competition among ISPs encouraging growth in dialup customers and increasing numbers of leased line/vpn access for businesses. Telecentres are not evident, but cybercafés are appearing in several towns. One in Windhoek has 45 seats and claims to be the largest in Africa. Access times during peak hours are very long.
Internet Affordability	Rates vs. Income Competition	2/2+	Local call rates are reasonable compared with other African countries, but still charged per minute, rather than flat rate. ISPs who obtain their connectivity via the incumbent data access provider offer national dialing and a discount of 20% on voice call rates. The incentive is there but cost remains an inhibitor to Internet usage. At $300-500 a month, the rental of 64kb leased lines remains costly.
Network Speed and Quality	Success Rate Dropped Connections Faults/10 Mainlines Transfer Speeds – Dial-up Transfer Speeds – Leased Line Backbone Capacity Packet Loss	3/4-	Despite being a monopoly, the incumbent telco has invested steadily and substantially in its network and the countrywide fibre-based digital backbone is of high quality and reliability. Outgoing bandwidth for data transmission remains at 2Mb and incoming at 6Mb. This results in congestion for Internet usage. There is also a large amount of “dark” fibre owned by the transport and power parastatals, which could be utilised once competition is allowed.

Aspect/Category	Key Performance Indicators	Rating	Comments
Hardware and Software	Local vs. Imported Affordability	2/3	All hardware and generic software is imported, mostly directly rather than through local distributors. Nonetheless there are concerns about the number of "middlemen." Prices are quite high. There is competition among the major IT providers who are starting to offer outsourcing capabilities.
Service and Support	Mainline Installation Time Problem Resolution ICT Personnel	3/3	Mainline installation takes a few days and problem resolution is quick. Technicians and other ICT professionals are concentrated in Windhoek, but branches and independent IT SMEs exist in several locations throughout the country.
Networked Learning			
Educational Access to ICTs	Access at Different Levels Computers/Student Availability of Computer Labs Latest technology Networking Access to Internet	2/3	Rapid change in educational access is evident at all levels. The funded SchoolNet programme has rolled out computer labs in 200+ high schools, collectively making up 2000 computers. The University of Namibia has an active ICT programme and will offer Masters level degrees in IT from 2003. The Polytechnic of Namibia diplomas and degrees in IT and is embarking on an aggressive campaign to make all its students computer literate. Internet access, however, remains very slow throughout the system. NIED is introducing IT studies in the colleges of education throughout Namibia.
Enhancing Education with ICTs	Training of Teachers Use by Teachers/Pupils Sophistication of Use Included in Curricula	3/2	The use of computers for education lags behind available facilities. Few teachers are computer literate, teacher training has not been emphasised and there is little evidence of incorporation of computers and the Internet in the learning process. This could change quite rapidly, with the Namibian Institute for Educational Development taking the lead in promoting ICT in education in cooperation with a consortium of donors.
Developing the ICT Workforce	Opportunities for Training Scope of curricula On-Line Learning	2/3+	There are many face-to-face and online opportunities for professional training in ICT, often through local branches of South African institutions. The usual product-specific training courses such as SAP, CISCO and Microsoft are readily available.

Networked Society			
People and Organisations Online	Awareness of Internet Use of Internet (%) Gender of Users Domains/1000 people Extent of advertising in traditional media	3/3	While Internet awareness is at a high level in Windhoek and there is active dialup and business usage, and perhaps awareness is spreading further a field thanks to the SchoolNet project and the tertiary institutions, large segments of the rural population will not have heard about it. Young males still dominate as users. There is some advertising of Internet addresses in the traditional press.
Locally Relevant Content	Number and Dynamism of local websites Use of Local languages Sophistication of Use Web-Based Training Opportunities	3/3	There are relatively many Namibian websites, essentially in English, which is the dominant web language of Namibia. Websites are largely static. NOLNet and NAMCOL are spearheading opportunities for online learning and distance education, but those aspects have yet to take off.
ICTs in Everyday Life	Telephone Access and Usage Household commerce use Public Internet Access Options	3/2+	Public telephones are widely available, but probably dwindling in importance as mobiles spread. Home access to the Internet is largely in Windhoek, but soon the rollout of SchoolNet and Microsoft schools sites as well as cybercafés will draw many more into ICT usage.
ICTs in the Workplace	Efficiency Gains through use of ICT Networking Extent Employee Internet Access Own e-mail accounts Publicise e-mail addresses	2/3+	LANs and WANs are common among the larger Namibian companies and the major firms and parastatals are progressive and effective users of ICT. Large numbers of employees in the private and public sectors in Windhoek in particular, have email addresses and Internet access. Local and international bandwidth inhibits Internet usage at peak times.
Networked Economy			
ICT Employment Opportunities	Requirement for Technical Skills Economy based on 'Knowledge Worker' ICT seen as Strategic by Organisations	2/2	The Namibian economy is not yet "knowledge-based." A few organisations see ICT as strategic, and there is certainly a demand for IT professionals in Windhoek. It is not known however whether there is a real brain drain or indeed whether some IT people have to seek employment outside Namibia.

B2C Electronic Commerce	Use of Websites by Business Volume of online Retail	2/3-	Ecommerce is embryonic in Namibia. The most prominent sectors are banking and tourism. Internet banking is available and perhaps 200 tourist outlets enable Internet-assisted booking. There are other business websites, generally static and behind in updating.
B2B Electronic Commerce	Efficiencies in B2B Electronic Commerce Incorporation of Web into Key Processes Order processing and delivery executed electronically Electronic B2B large and growing	2/3-	Apart from the banking sector, B2B ecommerce is minimal in Namibia.
e-Government	Ministries post key Information on Web Interactive Government websites Procurement/other interactions online	2/2	There are several government websites, but they are informational and not necessarily up to date. As yet there are no e-enabled procurement procedures, or services to the citizen. There are some innovative applications such as mobile ATMs to allow rural pensioners to receive payments and draw cash at their villages.
Network Policy			
Telecommunications	Liberalization Universal Access Options for Services Incumbent networks open to competition Competition in mobile Value-Added Services	2/2	Namibian telecom remains a state-owned monopoly. While there is an ICT policy that is about to be adopted by government and a draft telecom bill that sets out to strengthen the regulator, open up telecom to competition and institute a universal service fund, historically these processes have taken a long time to bear fruit in the country.
ICT Trade	Tariffs on ICT equipment Trade in services liberalized No additional tariffs on e-commerce Foreign Direct Investment	2/3-	Tariffs on ICT goods and services are low and there are no specific restrictions on ecommerce. Also, however, there are no cyber laws in place, resulting in some uncertainty as regards ecommerce for instance.

It can be seen that generally where there has been a shift, it is towards a more developed information society. There are anomalies compared with the earlier surveys in regard to ICTs in education and ICTs in everyday life. Rather than implying a retrogression, however, it is felt that the earlier assessments were simply too enthusiastic.

Chapter 7. ICT, Governance and Poverty. Perspectives on Namibia.

7.1 ICT in the Public Sector. A case for improved services.

It is an often repeated intention in Namibian political circles that Namibia's government should be more decentralized. There are two main objectives associated with this: To improve the quality of service delivery, and to improve the citizens' ability to communicate with, and to influence the government. How can improved government ICT resources and systems support these objectives?

Elsewhere in this study (see the Summary and conclusions section) we have described the slow development of the Government's IT and ICT capacity. Given the relatively good ICT capacity in Namibia it is a pity that ICT in Government has not received sufficient attention. There are several basic systems that if they were implemented would greatly enhance the service delivery capacity in Namibia. One such system is a national population register. The issuing of national identity cards is in crisis, and it can also be very difficult to obtain birth certificates and passports. The current systems are a mixture of manual and computer based, access to registers is uncertain and cumbersome and data quality is questionable. There have been several proposals for new systems over the years, but no comprehensive project has been started. There is also no national register for land and property (land in the communal areas is not formally adjudicated and registered) . There is no national computer based company register[13], and there is consequently no coordination or data interchange between systems for population, companies, property and the systems for taxation in the Ministry of Finance. As a result of all this, the Government as a whole is suffering from low efficiency and high transaction costs. This has direct consequences for the services offered to the public – they are slow, expensive, cumbersome, bureaucratic and vulnerable to corruption, and they are not available where the citizens need them.

Namibia's extreme physical distances and its good ICT infrastructure makes the proposed decentralization particularly attractive. The government has been working to create an "Intranet" to connect central and local government offices. Such a system would open up the use of some central systems so that transactions could be made from remote locations. It would also allow email communication throughout the government sector, and also with the general public. As a result, transaction costs and delays would be reduced and the level of efficiency could be improved. However, decentralized delivery of national services require particularly reliable *national* solutions. If the citizens in Rundu find it difficult to obtain passports, the solution is not a local passport register for Rundu, but a reliable national system that is *available* in Rundu trough secure and functioning ICT services. Availability in this context also means affordable, which brings attention to the monopolistic market situation in the telecom area. A rapid implementation of the proposed telecommunications Act is therefore a necessary condition for a successful decentralization.

The awareness throughout the Government sector of the benefits of additional ICT investments seems low, and budget allocations to ICT projects through the regular budget have been insufficient all the time since Independence. The current ICT policy document does not sufficiently stress the necessity of large ICT investments to create a more efficient public sector in Namibia, and neither is it prominent in the NDP2. As we have observed elsewhere in this report, the IT unit in the Office of the Prime Minister is now running at half strength, and its attempts to coordination are counteracted by investments made by individual ministries. As we have indicated in this section, the creation or upgrading of several national ICT systems should be given national priority and be allocated sufficient resources for implementation.

In summary, central and local government institutions should be upgraded to deliver low cost, fast and good quality services to the Namibian public. In Namibia's case much of it can be rectified with a relatively small investment and in a relatively short time. In order to start the process, a

[13] It is a sad fact that the best computerized company register for Namibian companies is maintained by Dunn and Bradstreet. Try a search for a Namibian company at www.dnb.com

national conference on the use of ICT in Government should be convened with the objective to rally civil servants, politicians and citizens behind a drive for an efficient government.

7.2 Poverty and Information Technology

It is a historical fact that material poverty and lack of information go hand in hand. A poor person is perhaps not always lacking in knowledge, but it is harder for her than for a rich person to acquire such information that she needs to improve her life. Poor people often live in isolation, being the last ones to know where there is work, where the cheap goods are sold, how to avoid usurers etc. In relation to their income, information gathering often becomes very expensive.

In less developed countries poor infrastructure makes information particularly hard to get. When telephones are lacking and with inefficient postal services, people have to travel to establish communication. This adds to the burden of the poor, who end up paying proportionally more for their actual *connectivity*[14] than those with better incomes.

Most published books and papers[15] dealing with the "Digital Divide" tell the same story. They all start by stating the well known fact that poor countries have less ICT, and that social stratification works in the same way across all countries: high income, high education, managerial position, male sex and a certain age are strongly correlated with more usage of Internet and modern media. This is of course true regardless of if one looks at a rich or a poor country. At the bottom of the connectivity pyramid are the poorest people of the poorest countries. They live in rural areas or in shantytowns in Lagos, Nairobi or Antananarivo and they have no access to any of the modern blessings of ICT. They do not even have radios. They lack most other things as well, their health and security is bad, they have no jobs, and they are much more likely to be illiterate than others, and they are less likely to exercise their civic rights without interference. What relevance can ICT have to them?

When we try to interpret the new information society, we tend to look at what benefits we can get from it ourselves. In the year 2003, with almost universal usage among the well educated in the first world, we can begin to see what we get out of it – better banking services, easier shopping and booking of services, access to useful information, and a great leap forward in written communication on the job and at home. None of this is even remotely relevant to the poorest people, because they have no access to the communication infrastructure that carries the content. They must be within earshot of each other to communicate, which explains why the poor have to travel so much by bus and Matatu in Africa.

Radio is a suitable medium to reach illiterate people with facts and information, and it is used all over the world. There are many examples from less developed countries (LDC) where for example information about government services such as elections, census activities, and agricultural advisory services are broadcast through private and public service channels. If radio services are included under the ICT umbrella, they can provide many examples where the poor actually benefit from an ICT application. In some countries access to air time is strictly controlled by the government, and used mostly for political or commercial propaganda, neither of which would directly improve the lives of the poorest.

Fixed line telephony in LDCs is a privilege for a small elite. The poor have no phones. Mobile telephony, however, has made a difference throughout the LDCs because it through the wireless technology covers an *area* with potential connectivity. When a GSM antenna is put up in Ondangwa, *all the people* in the covered area are technically connected to each other. A hand-set and a prepaid SIM card is all it takes. The way in which cell phone traffic has increased in LDCs tells us a great deal about the economic value of connectivity. Almost all cell phones in poor areas are prepaid, and therefore the user has a very clear understanding of the cost of making a

[14] I use the word connectivity in a broad sense to emphasize that in order to communicate with another person it is necessary to be within earshot, or to use a medium to transmit a message.

[15] Norris, P: *Digital Divide*. Cambridge University Press 2002; Solomon, Allen, Resta (eds.): *Toward Digital Equity – Bridging the Digital Divide in Education*. A & B, Boston 2003; Servon, L: *Bridging the Digital Divide*. Blackwell Publishing, 2002.

call. At almost every instance, the user will therefore be able to compare the cost of the call with the utility resulting from making it. The cell phones are mobile and personal, and it is also easy to share their use. The Grameen Village Phone[16] story shows how easy it is to organize the sharing of phone services through a society, and even if no specific studies about sharing have been made in countries in Africa, common sense suggests that it is widespread. Since a poor person by definition has very limited economic resources for gathering information, the value of information from a successful phone call is relatively greater than for a rich person. A "successful phone call" can be pragmatically defined as a situation where *connectivity* enables her to avoid the time and expense of a long bus trip, or one that gives her knowledge about the availability and location of cheap goods or services. In the first world, the arrival of cell phones and the Internet brought only marginal improvements to an already well functioning connectivity. In Africa, cell phones is the difference between no connectivity and some.

If and when African *rural areas* get wide area, wireless Internet coverage at low cost, this will lead to dramatic improvements of the connectivity. New poverty-alleviating effects will occur, more varied and more widespread, first through the immediate effects from email communication. The Internet will be much more effective than radio in disseminating advice and information, because of the ability to tailor advice to local, social and temporal differences between recipients and because of its interactive nature.

In all the reports written about Internet in poor countries, there is much worrying about the lack of relevant content for the poor. But the poor are not users today, so they are not losing out anyway. Once the poor get connected through cheap, high quality telecom and Internet services, they will figure out how to use them. Before that, whoever tries to produce "relevant content" will just be second-guessing the poor for their real needs.

When connectivity becomes generally available with good wireless coverage, community communication centers will start to appear spontaneously in villages. Message delivery services will emerge, with local message runners delivering and recording voice messages[17] or messages about received emails to individuals. Notice boards will inform people about emails to be collected. In time, most people will have their own email addresses, and will pay for services just as at any Internet café today. The ability to send and receive voice messages via the Internet will create an totally new dimension in connectivity for poor and illiterate people.

Finally, the poor can get several indirect benefits from the application of modern ICT, but they are all dependent on lower connectivity costs. Interactive delivery of health information, as well as a functioning mechanism to order drugs and supplies from remote health facilities can improve rural health services to poor people. Schoolnet facilities giving connectivity to remote and disadvantaged schools can dramatically improve the quality of education for the poorest students. And the introduction of modern delivery systems for birth certificates, ID cards, driving licenses, school applications, company registrations and other civic services can also give the poor relative advantages through the removal of bribes, reduced costs and queues.

A rapid deployment of the wireless technology into poor rural countries in Africa will need substantial investments, and it requires active support of states in order to attract the necessary capital. The states will have to make clear policy statements and decisions about the status of the new technology, and regulatory mechanisms will have to be developed to coordinate technological development. Donor agencies around the world should actively assist in reducing some financial risks, thereby speeding up the allocation of capital needed to build the networks.

7.3 Namibia

In Namibia, there is widespread rural poverty throughout the Northern regions, in the Omaheke region, and in towns throughout the country. Most poor rural households try to make a living from

[16] www.grameenphone.com www.opt-init.org/framework/pages/appendix2Case2.html

[17] Even today, it is possible to record a voice message on a computer and to send it as an attachment to an email. It can then be transferred to a MP3 player.

growing mahangu crops in the north, and from cattle farming elsewhere. Agricultural conditions are difficult throughout Namibia, and there is not much ICT can do to increase rainfall, improve soil fertility or reverse bush encroachment on grasslands. A reduction of rural poverty must eventually mean that higher incomes be generated through a shift from agriculture to other occupations. Improved connectivity can, however, change the cost structure of rural households in ways that have been discussed above. Access to mobile phones and wireless Internet will first reduce the connectivity costs, and also make other rural activities more cost effective and competitive.

Since Independence, there has been a rather phenomenal economic growth in the area around Ondangwa and Oshakati. Large investments in infrastructure have been made. Nampower's supply of electricity has tripled in 10 years, roads, schools and health facilities have been built, and both fixed and later mobile telephone coverage has increased dramatically. Private investments in real estate, commerce and industry have followed, and Oshakati has in 12 years been transformed to a vibrant commercial and employment center. ICT resources are vital in this new economic situation, as they are everywhere in Namibia – they are needed to overcome the enormous distances in this vast country.

Schoolnet's deployment[18] of a wireless Internet network for schools in Namibia will be worth following. It is one of the first large scale wireless internet networks in the developing world. If it works as expected, it will dramatically reduce connectivity costs and Internet capacity for a large number of schools and rural communities in Namibia.

[18] www.schoolnet.na

8. Summary and Conclusions

The overall impression of the ICT situation in Namibia is a very favourable one. The infrastructure has been tremendously improved in the twelve years after Independence, the number of fixed lines has doubled, the mobile network covers most of the population, the Internet can be accessed throughout the country, and 600 leased lines are in operation. IT competence is widespread, several large companies in the modern sector operate sophisticated enterprise software, and practically all tourist operators, lodges and guest farms can communicate via email and the Internet.

The majority of the population, however, live outside of the modern sector, and except for the (potential) access to mobile phones, they are not touched by the ICT revolution. Schoolnet's wireless IP network may change this, as many schools may become local communication centres when they get connected in the next few years. Compared with all other available options, this is clearly the most realistic approach towards more universal access, fast-tracking access by many years—if it works.

There are a number of problems with Internet use in Namibia. Internet access is slow because of local, regional and international congestion, largely caused because there are too many users sharing the available capacity. High prices for bandwidth force many organizations to make do with too little; there are several examples of companies with many users who share a single 64 kbps line. . Monopolistic behaviour by Telecom Namibia and its subsidiary Infinitum constrains the supply of International bandwidth. The situation is not helped by the fact that the only other supplier, UUNET, also enjoys high prices through the imbalance of supply and demand. It is very likely that increased competition would add capacity at all levels, and that this would lead to lower connectivity prices. For the last five to seven years a competitive telecom environment has been promised, but so far the tangible result is only a draft communications bill. While the bill is forward looking in terms of a strong regulator and open competition for all classes of telecommunications service there are small hopes of it becoming reality for another two to three years. In the meantime, potential investors in ICT capacity, for example Nampower, are blocked from entry.

In all fairness, Telecom Namibia has by and large acted as a responsible public utility company, investing large amounts in modern technology and expanded capacity, as well as expanding the fixed network and public access through pay phones into the densely populated areas in the north of Namibia.

Namibia needs with immediate effect a large addition to its international bandwidth. Telecom Namibia does have the financial means to effect this, but short-term profitability concerns stand in the way; more bandwidth would immediately translate into lower prices for fixed lines. Against this stand efficiency losses in the economy from having to rely on a constantly congested Internet network. Like many other monopoly operators, Telecom Namibia is protected from the public's view, and does not have to face its customers on issues of price and quality.

When the new communication legislation comes into effect, the role of the Communication Authority will change dramatically. Today, it has no role as an arbitrator, and limited competence in this area. Its main activity today is to issue radiotelephony licences for use in the commercial farming areas—bush radio. In anticipation of a competitive environment, a new organisation needs to be created with financial autonomy and necessary capacity. This will take time, and it should be started immediately.

Namibia still has a long way to go in building the human capacity to accelerate its development as a networked society. Specifically the mainstream educational system has yet to act on its own 1995 policies to strengthen the role of computers in schools curricula and school administration. There is, however, some recent movement in the National Institute for Educational Development and this initiative should be strongly supported. On the positive side, the University of Namibia and the Polytechnic of Namibia are both making strong moves to enhance their technical capabilities, change educational offerings and offer their educational products via distance learning. At the school level, Schoolnet is growing and expanding into new areas. Initially, the responsibility for building the wireless IP network should stay with Schoolnet, but it must be realised that the

management and support of a communication network with thirty transmitters and at least 600 schools is a big task, requiring considerable resources on a regular basis. Schoolnet must quickly be transformed from an evangelist to a business mode of operations. This will require a budget and hired staff. The voluntary contributions by young students to Schoolnet are and have been a key to its success, and ways have to be found to keep it that way. Schoolnet's credibility among young people—its only clients! —rests with the youth connection. It will be a great challenge to strike a balance between the needs of good and professional management, and the enthusiasm and energy coming from its members.

The government is a big user of ICT in Namibia. There is a government IT centre under the Office of the Prime Minister, essentially a relic from the mainframe days, in charge of maintaining a number of legacy systems for central government, such as state budgeting and accounting, and the government payroll. New IT technology has moved IT decisions away from central systems; they are now made at the ministerial and departmental levels. The IT centre has made attempts at coordinating IT technology decisions and purchasing, but apparently with little success. In this respect, the development in Namibia is not different from other countries. There are plans to create a "Government Intranet," with the objective of facilitating electronic communication within government on a national scale. A number of servers have been installed, connected via a number of VPN leased lines. In a number of cases, cabling for ministerial LANs have been drawn, and some limited email facilities exist within and between the central offices in Windhoek. However, the technical infrastructure is inadequate, there are too many users sharing the facilities within the government domain, and access to the Internet other than for email is in practice not available. Many offices allow Internet access from separate PCs only. The problems are by and large financial; the budget allocations to provide adequate communication facilities have not received priority among all other needs of the young state. To a large extent this may be a question of attitude towards the very modernity of IT. It is possible that computers—and by implication also communication—are secretly regarded as a "luxury" by some ministers and politicians, as they are competing with more "real" needs like health and education for scarce government resources. If this is the case, there is a great need to "market" ICT as a great tool to enhance the capacity of the civil service through improved communication. We have seen no evidence of such marketing, except in a generally favourable attitude from the previous pioneering Minister of Information and Broadcasting (Ben Amatilha) and the now retired previous prime minister.

The amount of extra money required to upgrade the government's communication network to a well functioning one is probably not very large – an additional allocation of for example ten million Namibian dollars over a two year period would make a big difference. This would allow for the upgrading of a number of servers and redesign of the connectivity network. Incidentally, this sum is equivalent to what the Government recently paid Microsoft for a settlement over unregistered software licenses.

In evaluating Namibia's "readiness for the networked world," it is noticeable that the country's exploitation of ICT in business and government (as measured by stages of growth in ecommerce and egovernment in particular) lags behind the actual technological capabilities of the country. There are thus for instance untapped opportunities for Namibia to take stronger advantage of worldwide trends towards increased tourism through full use of ecommerce in the business-to-consumer arena, and through full use of business-to-business ecommerce to take advantage of opening world trading opportunities, especially the Africa Growth and Opportunity Act of the United States, and easing of trade restrictions into Europe. Exploiting such opportunities can of course be left to the marketplace, but government could well play an important facilitating role by creating incentives for more effective exploitation of ICT and creating a more secure business environment for ecommerce through appropriate legislation.

Appendix 1: Key Ratios

Description	Value/Operators
Number of fixed line telecom operators	1
Number of mobile line telecom operators	1
Number of Internet Service Providers	3 major providers
Possible Alternative Suppliers of Bandwidth	None
Number of Internet Points of presence	Uniform telephone rate
International Bandwidth	2mbps outbound, 6mbps inbound
Population of Namibia	1.8 million
Users	150000
Number of Fixed Lines installed	120000
Number of Fixed Lines per 1000 inhabitants	66
Temporarily inactive	Low number
Average waiting time	A few days
Public telephones	5000
X.25 subscribers	?
Number of digital leased lines	600 (2001)
Fixed line capacity	173,000
Expansion Rate: Number of new lines/year	Ca. 4,000
Percentage of Digital Switchboards	100 %
Number of mobile phone subscribers	150,000
Geographical coverage of mobile networks	All major population areas. 65% of pop.
Number of mobile telephone subscribers per 1000 inhabitants	83
Expansion Rate: number of new subscriptions/year	98 – 99: 10.000 99-2000: 52,000 2000-01: 38,000
Number of Internet Subscriptions	12,000 – 15,000
Number of Internet Subscriptions in the Capital	10,000
Number of Internet Subscriptions per 1000 inhabitants	8
Number of new Internet Subscriptions last year	N/A
Number of Internet Hosts	4000
Number of Internet Hosts per 1000 inhabitants	2
Number of new Internet Hosts last year	?
Number of Internet Cafes	Five in Windhoek, others in all major towns
Number of Multipurpose Community Centres	None known

Appendix 2: List of people met.

First Name	Last Name	email.	Company
Onno	Amutenya	oamutenya@npc.gov.na	National Planning Commission
Ceiran	Bishop	ceiran@schoolnet.na	SchoolNet
Mandy	Bruckner	ambruck@mweb.com.na	Consultant
Martha	Dama	martha.dama@bon.com.na	Bank of Namibia
Tina	Dooley-Jones	tdooley-jones@usaid.gov	USAID
Laurent	Evrard	laurent@polytechnic.edu.na	Polytechnic of Namibia
George	Ferreira	gferrer@microsoft.com	Microsoft
Philip	Galliano	philipg@uunet.com.na	UUNET
Ferdi	Graupe	ferdig@comparex.com.na	Comparex Namibia
Neil	Hammond	neal.hammond@fco.gov.uk	British High Commission
Nangula H.N.	Hamutenya	nhamutenya@opm.gov.na	Office of the Prime Minister
Barney	Harmse	barney@proudlyafrican.com	Consultant
Kevin	Higgins	kevin.higgins@debeersgroup.com	Be Beers Marine Namibia
Dave	Hill	davehill@gatewaynamibia.org.na	Namibian Development Gateway
Harry	Hoff	pcspec@iway.na	PC Specialist
Nikki	Irwin		MTC
Claus	Jensen	clausj@transnamib.com.na	Trans Namib
Geoffrey	Kiangi	gkiangi@unam.na	UNAM
Gerrit	Koekemoer	deadset@africaonline.com.na	Africa Online
Joris	Komen	joris@schoolnet.na	Schoolnet
Manjo	Krige	manjo@mweb.com	Mweb
Jan	Kruger	janhk@ncc.org.na	Namibian Communication Commission.
Rauna	Lenga		Bank of Namibia
Bernd	Masche	yrida@olfitra.com.na	Namibian Breweries
Lionel	Matthews	lionel.matthews@olfitra.com.na	National Breweries
Francis	Mensah	Francis@namcol.com.na	Namibian College of Open Learning
Frans	Ndoroma	ndoromaf@telecom.na	Telecom Namibia
Gideon	Nhundu	gideonn@africaonline.com.na	Africa Online
Miles	October	miles@uunet.com.na	UUNET
John	Patton	john@einitiative.org	Initiative Foundation
Theo	Schoeman	theo@schoemans.com.na	Schoemans
Gert	Scholtz	gert@ast.com.na	AST Namibia
Mocks	Shivute	mmshivute@mib.gov.na	Ministry of Information and Broadcasting
Heidi	Soule	hsoule@nied.edu.na	NIED
Isac	Tjombonde	tjombondei@nampower.com.na	Nampower
Leopold	Valeno	komwenyo@hotmail.com	PC Specialist
Gert	Werner	gwerner@telecom.na	Infinitum / Telecom
Theo	Whittaker	theo@schoolnet.na	Schoolnet

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Halving poverty by 2015 is one of the greatest challenges of our time, requiring cooperation and sustainability. The partner countries are responsible for their own development. Sida provides resources and develops knowledge and expertise, making the world a richer place.

SWEDISH INTERNATIONAL
DEVELOPMENT COOPERATION AGENCY

SE-105 25 Stockholm Sweden
Phone: +46 (0)8 698 50 00
Fax: +46 (0)8 698 56 15
info@sida.se, www.sida.se