Antelope Consulting

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DFID Internet Costs Study

Appendix H: Supplementary information from other countries

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Contents

1 ITU case studies

1.1 Introduction

The International Telecommunication Union (ITU) has undertaken case studies of various countries for different purposes in the last few years. These case studies constitute one of the few detailed sources of information that are publicly available about telecommunications in developing countries. This paper reports evidence from the ITU case studies of countries, which might have a bearing on the issues in our Terms of Reference.

The ITU has undertaken two relevant series of case studies recently:

- Case studies of the rate of internet diffusion,
- Case studies of IP telephony (i.e. telephony delivered over a private or public internet network).

Relevant points from these case studies are noted below. We also reviewed the briefer ITU studies of Lao, Malaysia and Tunisia, which were written at the end of 2000, but these did not have any relevant points.

1.2 Internet diffusion case studies

1.2.1 Nepal (November 2000)

At the time of the case study, the Nepal Telecommunications Company did not own an Internet Service Provider (ISP). NTC reduced its IPLC prices when private ISPs installed their own VSAT links - all the ISPs stopped buying IPLCs from NTC when they were allowed to use VSAT.

There are no open Internet exchanges, just loose peering relationships - the Government or an ISP should establish an IXP to consolidate international traffic.

1.2.2 Uganda (January 2001)

There is no national peering. The ratio between inbound and outbound capacity is about 2:1.

The regulator should encourage an IXP, and the construction of one national fibre backbone rather than competing narrowband networks.

(The case study does not consider the possible pitfalls of insisting on a fibre backbone). The Government should seek greater regional connectivity.

1.2.3 Bolivia (February 2001)

Legal restrictions forbid ISPs from directly providing their own outgoing international connectivity or domestic leased lines. The ISPs claim that this results in higher costs, poor service and unfair competition from the traditional telecom operators that provide Internet access. The option to provide their own incoming international connectivity has not been taken up.

Leased line prices in Bolivia are said to be some of the highest in Latin America. In the second half of 1999, a 64 kbit circuit from Bolivia to Brazil cost US$ 3000 per month, while - according to the case study - a circuit in the other direction cost only US$ 1714. (These prices may be the prices of the respective half-circuits, rather than different prices for the circuit depending on its "direction").

Bolivia lacks a national traffic exchange for Internet traffic, with the result that messages from one Bolivian to another go via other countries. The Government should promote the establishment of a national Internet traffic exchange.

1.2.4 Egypt (March 2001)

The price of international leased lines used for Internet has been cut by 30%, and the price for premium rate Internet access has been cut by 50%, both as from 1 October 2000. Premium rate internet access has been about double the price of a local call, so the reduction will presumably bring the premium internet price down to the price of a local call; the benefit for Telecom Egypt, even if it receives less money, will presumably be that internet traffic can be kept separate from the rest of its network.

The Government's Information and Decision Support Centre (IDSC) has taken on the role of promoting ICT in Egypt. It is the major supplier of Internet bandwidth within Egypt (70%, the rest being supplied by Telecom Egypt and Geganet), and it is cheaper than Telecom Egypt for both dial-up and wholesale connectivity. The IDSC network is maintained by Telecom Egypt. Capacity on the IDSC backbone has sometimes been over-sold.

Telecom Egypt has a monopoly of terrestrial international connections, although 2 ISPs have been allowed to have direct connections with the US. Connections using VSAT have been liberalised.

ISPs arrange for inbound to outbound capacity in the ratio of about 4:1, with outbound being terrestrial and inbound being satellite, except for time-sensitive applications (e.g. chat, audio). This ratio is optimised for Egyptian users of the internet browsing North American websites but imposes delays on foreign users of Egyptian websites, e.g. for tourism.

1.2.5 Singapore (April 2001)

Singapore now has 18 Internet exchanges - previously SingTel operated the only one (www.ix.singtel.com).

1.2.6 Hungary (April 2001)

The case study has nothing of direct relevance to the study, perhaps because Hungary is close to a good deal of international fibre anyway, which would mean that the cost of circuits to the US is not an issue.

1.3 IP telephony case studies

1.3.1 Thailand (March 2000)

The compulsory 32% holding by CAT (the international monopoly operator) in every ISP in Thailand is estimated to increase ISPs' prices by 20%, since ISPs can earn their required rate of return on capital from only 68% of the profits.

The cost of international Internet bandwidth is a significant expense for ISPs in developing countries since they must bear the full cost of the connection. IP telephony will be constrained as long as the cost of international bandwidth remains high. On the other hand, ISPs and IP telephony companies in the United States get free Internet connections to other countries. This is one reason why IP telephony prices are so much cheaper from the United States to other countries. The study calls for foreign IP telephony companies to forge deals with developing country ISPs that include the provision of Internet backbones and VSATs, this will add to the bandwidth of the country and enable better quality access. Local partners can also benefit from training in the deployment of IP-based networks.

1.3.2 China (January 2001)

China Telecom, effectively the monopoly supplier, apparently shows little compunction in squeezing as much money as possible from the 150 or so ISPs, with the result that line rental costs account for about 80% of an ISP's costs, compared with 5% in the US. One of China Telecom's practices is linking the line rental to the amount of revenue per line, so that rental rises with volume. ISPs feel that this makes it unprofitable for them to take on extra business and the result is said to be that many of them cannot survive without some degree of assistance or lenience from China Telecom. Many of the companies granted ISP licences have either stopped offering ISP services or have been incorporated into the ChinaNet network.

Access to some ISPs in China is provided through pre-paid cards.

1.3.3 Colombia (January 2001)

In 1999 an Internet exchange known as the Network Access Point (NAP) was established in Colombia where all ISPs exchange traffic. Cisco donated the routing equipment to enable the first 16 ISPs to be connected to the NAP. Telecom, the dominant operator, also had plans to open an NAP at Barranquilla, the landing point for the new Pan American submarine cable on the Caribbean coast, to serve ISPs in both Colombia and Ecuador.

Countries like Colombia and Argentina with high settlement rates for international telephone calls have been punished by US carriers refiling the traffic through countries with lower rates or bypassing the accounting rate mechanism, e.g. by sending the traffic over the internet.

1.3.4 Peru (undated but apparently March 2001)

During 2000, five ISPs including Telefonica de Peru, the dominant operator, agreed to deploy the first Neutral Access Point (NAP) in Lima, in order to interconnect Internet traffic at a local level. The NAP will avoid the need to send the local Internet traffic to the US before returning it to Peru. This was seen as an important step, reducing unnecessary costs of transiting Internet traffic. The Government was involved in the creation of the NAP by acting as coordinator and facilitator in the implementation of the project. The administration of the NAP will rotate between the signatories of the agreement.

IP telephony has led to a substantial shift of traffic between the US and Peru from the PSTN to the Internet, with some interesting developments

in the growth of international private circuits between the US and Peru as a consequence, according to FCC figures:

- The number of US-Peru PSTN circuits increased gradually from 1995 to 1999,
- US-Peru private line circuits however have grown faster, with a jump from 394 in 1998 to 1,130 in 1999, thus outnumbering the US-Peru PSTN circuits for the first time.

Competitors to Telefonica de Peru have made numerous allegations of anti-competitive behaviour by TdP. Resolution of these complaints has proved difficult in the complicated regulatory structure of Peru.

1.3.5 Korea (January 2001)

No points of relevance.

1.3.6 Canada (January 2001)

IP telephony is not common in Canada, probably because international call charges are so low.

1.4 Conclusion

On the whole, the ITU case studies do not disclose much of direct relevance to the Terms of Reference (and we were so warned by the ITU secretariat).

This may be because the information requested in our Terms of Reference could not be easily obtained during the week that the ITU spent in each country. It is not because the ITU was unaware of the issues in our Terms of Reference, as the issues were mentioned in some of the studies.

The most likely explanation for the case studies not having much of relevance to our Terms of Reference is that the ITU, and most of their interlocutors in the countries concerned, did not regard the international arrangements as the most salient issue. Apart from promoting the idea of Internet exchanges, the general theme of the ITU case studies is that:

- Competition is desirable (between ISPs, as well as between telcos);
- Tariff rebalancing is essential even though this will increase the price of local calls (to be mitigated by increased competition and by the introduction of special internet-friendly tariffs, e.g. untimed calls, or

access at local rate available from all over the country - the ITU does not however deal with possible objections to a policy of untimed local calls).

Concerns about the international arrangements seem to be secondary, in the ITU's mind, to concerns about competition and tariff rebalancing

2 Internet status in Ghana[1]

2.1 Internet penetration

The total number of ISP accounts in Ghana is approx 18,000 (April 2001). This figure includes dialup accounts, leased lines and modem lines. The number of Internet users is very hard to establish as one account generally has many users (for example, 1 cyber café is considered as 1 ISP account, with hundreds of users).

2.2 Cybercafés

We conducted 2 surveys in Accra, the first one in October 2000, the second in April 2001:

Date	No. of Cyber cafés	No. of PCs	Average Price $/hr	Occupancy Rate (From 8am to 8pm)
October 2000	43	416	1.15	71 %
April 2001	92	773	1.07	74 %

Table 1: Cyber cafés in Accra

Trends

- Cyber Cafés are now opening in every part of the city; the number has more than doubled in 6 months.
- More cafes are now offering IT training: they use a few PCs and staff specifically for that purpose. This seems to fit well an increased demand for better service, more productive use of the Internet.
- Main problems encountered are about connectivity (failure from ISPs), power supply (most cafes don't have a power generator and electrical supply is not reliable) and technical problems (generally servers).
- Access is generally slow; a majority of the cyber cafés is on dialup at 33.6 speed. Cyber Cafes can hardly afford better connectivity due to the cost of bandwidth.

[1] Thanks to Ellen McDermott of BusyInternet for the information reproduced here. BusyInternet (www.busyinternet.com) are setting up cyber cafés in Ghana and elsewhere in Africa.

- Café users are therefore limited in their use of the Internet (primarily emails): our surveys show a strong demand for browsing, use of other applications and services.

- Users are a mix of young people (the majority) such as students, but also professionals, traders, foreigners, and a few tourists. Majority of users are male.

We have no data for other cities in Ghana.

2.3 Internet Backbone Connectivity Providers for Ghana

Interpacket Networks Inc.	www.interpacket.com
IP Planet Networks Ltd	www.ipplanet.net
New Skies	www.newskies.com
PanAm Sat	www.panamsat.com
Teleglobe	www.teleglobe.com
Verestar	www.verestar.com

2.4 Internet Service Providers

As of the end of April 2001, there are 12 operating ISPs in Ghana:

ISP	URL
Africa Express	www.africaexpress.com
Africa On Line	www.africaonline.com.gh
Africanus	www.africanus.net
GS Telecom	www.gstelecom.net
IDN	www.idngh.com
Internet Ghana	www.internetghana.com
ITS	www.its.com.gh
Millicom Ghana Ltd	www.mobitelnet.com
NCS	www.ghana.com
Punch Communications	www.punchgh.com
Third rail	www.third-rail.net
Tin-IFA Ltd	

Table 2: ISPs in Ghana

Several more will start operations shortly and the total number of ISP licenses issued by the National Communication Authority is 23.

2.5 Data Network Operators

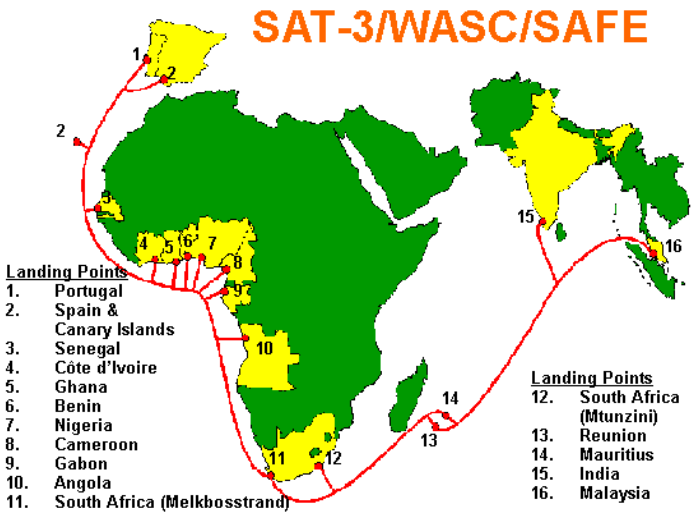
Afripa Telecom	www.afripatelecom.net
DataMatrix/Internet Ghana	www.internetghana.com
Ghana Telecom	www.ghanatel.net
Giant International Ghana Ltd	www.africanus.net
GS Telecom	www.gstelecom.net
K-Net Ltd	
Net Africa Ghana Ltd	
Third Rail Ghana Ltd	www.third-rail.net
Volta Telecommunications Company*	

Table 3: Data network operators in Ghana

*: VoltaCom operates a fibre loop (Tema-Accra-Kumasi-Takoradi) and plans for extension to other West African countries.

2.6 Submarine Cable

The SAT-3/WASC/SAFE fibre optic submarine cable is scheduled to reach Ghana by the summer of 2001. GhanaTelecom, a partner in the project, will offer fibre optic backbone connectivity for data and voice traffic.



3 Indicators for Pacific and APEC countries[2]

Country	Popula-tion	GDP per capita (US$)	Internet users	Internet users per 1000 population	Number of ISPs	Monthly price of 10 hours' dial-up use (US$	Monthly price for 64 kbps leased line (US$)
Cook Islands	17k	4947	600	36		30	4500
Micronesia	120k	2070	1400	12		29	2050
Fiji	764k	2684	3300	4		24	4880
Fr Polynesia	228k					36	
Kiribati	77k	702	390	4.5		67	4000
Marshall Islands	54k	1540				60	
New Caledonia	206k						1100
Nauru	10k						3500
Niue		3714	285	143		3	3000
Palau	16k	8027	1000	55		40	700
Papua NG	4,200k	1196	2000	0.5		69	5000
Samoa	176k	1060	700	4		7	1900
Solomon Is	386k	750	600	2		174	1600
Tonga	105k	1868	750	8		59	
Tuvalu	10k	1157	10	1			
Vanuatu	170k	1231	1050	6		28	1300
Ave PITA[3]						**50**	**2795**
Chile	20m	4810	150k	7		15	456
Indonesia	200m	680	80k	0.4	4	9	283
Malaysia	19m	3600	600k	32	2	24	520
Mexico	92m	3970	600k	6	388		316
Peru	24m	2460	30k	1	6	22	550
Philippines	65m	1050	400k	6	129	23	625
Thailand	60m	2200	100k	2	3	50	2045
Ave APEC DC[4]						**24**	**685**

[2] Source: Pacific Islands Forum Secretariat survey, unpublished, 2000. Some additional figures in the table were derived from standard statistical sources. Please note that some prices in the table are currently under review.

[3] PITA is the Pacific Islands Telecommunications Association

Country	Popula-tion	GDP per capita (US$)	Internet users	Internet users per 1000 population	Number of ISPs	Monthly price of 10 hours' dial-up use (US$	Monthly price for 64 kbps leased line (US$)
Australia	18m	20300	4.4m	240	450	9	63
Canada	28m	20020	8.9m	320	400	16	14
New Zealand	3m	14700	0.6m	200		19	48
USA	261m	29340	101m	390		21	49
Ave APEC IC[5]						**16**	**44**

[4] DC: developing countries
[5] IC: industrialised countries