
DFID Internet Costs Study

Appendix A: Country Case Study: Cambodia

Executive Summary

Cambodia is a very poor country, emerging from a civil war. The lack of fixed network and the corresponding small number of fixed telephone lines make Internet access complicated. In 2000 there was one Internet account per 5 fixed telephone lines (a very high proportion, indicating that the number of telephone lines is limiting internet expansion) and 0.25 fixed lines per 100 inhabitants (which is very low). A major concern is extension of Internet services outside the capital region. The poor quality of the network limits modem access speeds to less than 30 kbps. The number of mobile phones is nine times the number of fixed phones, but Internet access using mobile phones is slow and expensive.

Camnet is one of four licensed ISPs. Camnet's bandwidth for international Internet connectivity is presently 1 Mbps. This is small by current international standards, which means they have little bargaining power. The cost of this bandwidth is around 80% of Camnet's total costs. Global Internet connectivity is included in the price for the international leased line as a "free extra", which means that its real price is not known to the purchaser.

The government uses high tariffs for international leased lines as a source of cash. Very Small Aperture Terminal (VSAT) access supplied by competitors is priced accordingly.

The situation is a vicious circle: high charges for international leased lines result in low demand. Low demand results in little interest in investing in international high capacity optical fibre connections. This lack of interest results in higher underlying costs and slow turnaround time on satellite circuits, leading to low quality and high charges.

To extend local Internet access, rather strong measures are probably needed:

- Major expansion of the fixed telephony network (possibly involving privatisation of the state telco);

- Major investments in wireless dedicated Internet access; and / or

- Successful major introduction of mobile data communications.

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1 Background

Cambodia in a nutshell

Population	12 million
Population below 12 years	42 %
Population in capital area	9.4%
Area	181 000 sq km
Neighbours	Thailand, Laos, Vietnam
Life expectancy	57 years
Religion	Theravada Buddhist 95 %
Literacy	35 %
Government	Multiparty liberal democracy (1993)
GDP (estimate 2001) US\$ billion / year	5
Annual GDP / capita US\$	420
GDP structure	Agriculture 43 %, industry 20 %, services 37 %
Population below poverty line	36 %
State budget (1999, US\$ million)	Revenue 327, expenditures 393
Economic aid US\$ million	427
Fixed telephone lines	29 000
Fixed telephone lines in capital area	55%
Mobile telephones	240 000
Internet accounts	6 000
Internet hosts 2001 (http://www.nw.com/)	479

Table 1: Country data for Cambodia, mainly for years 1998 or 1999¹

Cambodia came out of some 30 years of civil war in the early 1990s. The recovery process has been on going during most of the 1990s. As Table 1 above shows, despite recent improvements, the country is still very poor, low incomes being accompanied by low literacy levels and low life expectancy. The population is extremely young.

One of the difficulties is the huge number of remaining land mines, hampering all economic activities, from agriculture to constructing fixed telephone networks.

The economic activities in the country are rather strongly concentrated in the capital.

2 Telecoms status

The current Post and Telecommunications Law is very basic, and concerned mainly with postal matters. New telecommunications legislation is under preparation using several consultants.

Present telecommunications policy regards the industry largely as generating cash to Government rather than as a necessity for development. Several features stand out:

- International telecommunications tariffs are high, similar to other developing countries; and
- Private operators have a revenue sharing system with the state monopoly MPTC (Ministry of Posts and Telecommunications), up to about 50 % for some operators; and
- Internet telephony is strictly prohibited.

A new telecommunications policy is under preparation, assisted by consultants. Several donors are active with technical assistance: KfW (Kreditanstalt für Wiederaufbau, Germany) assists with policy and rural telecoms, ITU (International Telecommunications Union) with legislation and regulation, The World Bank with competition legislation, interconnection and tariff rebalancing. A three-country (Cambodia, Laos, Vietnam) ADB (Asian Development Bank) project is in the pipeline on telecom policy and legislation.

Cambodia is not a member of the WTO (World Trade Organisation).

Cambodia has nonetheless by and large liberalised the telecommunications market. After the end of the civil war, Cambodia licensed private mobile telecommunications operators (in 1992) and some other operators. Some of the operators are Joint Ventures with the MPTC; some are fully private. Most operators have a revenue sharing agreement with the MPTC.

State involvement in telecommunications is organised through the Ministry of Posts and Telecommunications (MPTC)². The MPTC is simultaneously policy maker, regulator and operator. The MPTC operational arm has little decision power in terms of financing; it is a rather traditional state department and is dependent on the Ministry of Finance for all major financial decisions.

Telecommunications operators:

Operator	Type	Subscribers	%	Internet site
Mobitel	Mobile	150 000	56	http://www.mobitel.com.kh/
Samart	Mobile	48 000	18	
Shinawatra	Mainly mobile	40 000	15	http://www.thaicom.net/eng-information/cambodia.html
MPTC	Fixed	19 500	7	
Camintel	Fixed	5 200	2	http://www.camintel.com.kh/
Camtel	Mobile	3 000	1	
Total	Both	265 700	100	

Table 2: Telecommunications operators: Number of subscribers³

Most of the fixed telephone lines (reported to be some 29 000) are in the capital. MPTC operates in the capital, while a private operator Camintel (joint venture between the MPTC and Indosat of Indonesia) operates in other provinces (5 200 lines), mainly in provincial centres. In addition Shinawatra is said to have 4 000 Wireless Local Loop (WLL) lines.

Mobile operators are reported to have a total of some 240 000 connections. Mobile operators have significantly better geographic coverage than fixed. A significant proportion of mobile phones is answer-only, paying only rental or not even rental. Obviously mobile operators have realised that answered calls are paid for, and even answer-only phones indirectly generate revenue.

Cambodia is the supreme world leader in terms of proportion of mobile phones out of all phones (around 90 %!).

SMS¹ messages do work internationally, but seem not to work properly at least between the mobile operators. No exact information is available. Elsewhere SMS messages are to some extent used as a complement or replacement for e-mail. Due to uncertain functioning, this alternative cannot be used fully in Cambodia.

The small number of fixed telephone lines and the corresponding lack of network makes Internet access complicated.

¹ SMS means text messages that can be sent to and from a GSM telephone. A SMS message can include a maximum of 160 characters.

3 Internet status

The MPTC issues licences for Internet operations.

Operator	Customers	Web site
BigPond (Telstra)	4000	http://www.bigpond.com.kh/
Camnet (MPTC's subsidiary)	2000	http://www.camnet.com.kh/
Open Forum, e-mail only	400	http://www.forum.org.kh/eng
Mobitel	700	http://www.mobitel.com.kh/

Table 3: Summary of Internet operators

Camnet is a subsidiary of MPTC, running on a commercial basis except that it provides Internet access free of charge to a number of Government bodies (included in the customers shown above). Camnet pays normal retail charges to MPTC for its leased lines and access lines. This means that MPTC does not subsidise Camnet. Camnet is profitable, even if its financial details are not disclosed.

Camnet was initially established through a grant from Canada (around US\$ 0.36 million).

Open Forum's e-mail service is shrinking.

Camintel (rural fixed telephony operator) retails Camnet services in the provinces.

In addition the largest mobile operator, Mobitel, runs an Internet wireless broadband access service based on its data communications licence. That licence is disputed and Government has interrupted expansion of the service.

Except for the Mobitel service, all access is dial-up, at normal telephone call charges (local in the capital). No ADSL access exists, this is said to be due to lack of cable capacity. Camnet plans to introduce its own wireless access.

BigPond has an agreement with Government that no new Internet licences shall be issued before early 2002. The agreement is under discussion.

BigPond and Camnet both have their own international access. No direct satellite connection to USA is technically possible, thus an Asian intermediary is needed.

Camnet has presently two 512 kbit/s satellite lines: one normal leased line to Singapore and a VSAT connection to Hong Kong. It is also currently negotiating additional leased line capacity using the MPTC optic fibre cable to Thailand and Vietnam.

VSAT was not allowed as long as Telstra operated the country's international gateway under an exclusivity agreement (which expired in late 2000).

Service	Registration Fee US\$	Monthly Fee US\$	Free Use hours / month US\$	Usage Charge/hour US\$
Dial-Up Access				
Option 1	40	18	3	\$ 3.40
Option 2	40	30	8	\$ 2.70
Option 3	40	90	30	\$ 2.45
Option 4	40	300	120	\$ 2.25
Option 5	40	600	260	\$ 2.10
Option 6	40	1000	500	\$ 1.50
E-mail box		3		
Web Hosting	30	Free for up to 5MB, \$10 for up to 10MB \$10 for every additional 10MB		
Leased line				
9.6 kbit/s	500	900		
19.2 kbit/s	500	1200		
32 kbit/s	500	1800		
64 kbit/s	1000	2500		
Note: These are dollar tariffs from Cambodia. No exchange rate has been used.				

Table 4: Camnet's Internet tariffs since March 2001⁴⁵

Actual modem speeds as measured are often below 30 kbit/s.

Resale of Internet leased line connections is not allowed. No leased line customers were connected in early 2001. Telephony over Internet is strictly prohibited.

National interconnection between ISPs is not implemented.

MPTC has a new fibre optic cable to Thailand and Vietnam, but it seems to be unreliable due to cable cuts. All other international lines are by satellite.

Camnet experiences problems with the PSTN dial-up access (many local loops, as well as switches, are not of sufficient quality for dial-up modem access). The modem pool size is however sufficient.

Camnet also has quality problems with international lines. TCP/IP (the main protocol used for all communications on the Internet) on satellite is not sufficiently reliable. In addition the response time to USA using satellites is a minimum of 1.5 seconds, and 0.9 seconds to Singapore.

Camnet also needs more of its own IP addresses. Sharing IP resources is mentioned as a problem.

4 Internet costs

Both international connections (Singapore and Hong Kong) are paid at normal leased line rates / VSAT rates. In both cases onward access to the Internet (including any fees and use of e.g. intercontinental transmission capacity) is included within the price for the leased line or VSAT, and is not priced separately.

The monthly charge for the leased line to Singapore is of the order of US\$ 27 000, and for the VSAT connection to Hong Kong about half of that. Generally the international component is about 80% of Camnet's total costs (exact figures are confidential).

The cost component for international access seems to be the main cost concern. The cost level is part of the general tariff policy of the country, similar to other developing countries and also similar to most of the industrialised world 5 to 10 years ago. The tariff policy is under review as part of the on-going World Bank sponsored project (tariff re-balancing component). The outcome of this project is not yet known, but a reasonable assumption is that international charges may be lowered.

5 Projections

The present plans are for continued expansion of Internet services. Further liberalisation of Internet provision depends on the outcome of the on-going telecommunications policy work, and on expiry or withdrawal of the assurance on Internet licensing granted to Telstra.

Investment in dedicated wireless Internet access may be more necessary in Cambodia than in most other countries, as Cambodia lacks an adequate fixed telephone service covering the entire country.

Mobile data (basic GSM data, nominally 9.6 kbit/s) is working, however, it is too slow for Internet access. It is also much more expensive than fixed telephony, the price per transferred Mbyte of information in a mobile network may be even 100 times the price in a fixed telephony network.

No firm decisions have yet been made on licensing of third generation mobile services.

6 Conclusions

Cambodia apparently suffers from most hindrances for significant expansion of the Internet.

With a total of some 6000 Internet accounts, in the year 2000 there was one Internet account per each 5 fixed telephone lines. This means that the low number of fixed telephone lines may already restrict Internet usage. The restrictive impact is likely to grow as Internet usage grows more quickly than the number of fixed telephone lines.

Somewhat strong measures are probably needed:

- Major expansion of the fixed telephony network (possibly privatisation);
- Major investments in wireless dedicated Internet access; and / or
- Successful major introduction of mobile data communications.

A major concern is extension of Internet services outside the capital region.

Access - in Cambodia as well as elsewhere - presently depends to a large extent on fixed telephony. Because of Cambodia's low fixed telephone penetration (0.25 lines per 100 inhabitants), and its concentration in the capital, the fixed network is a serious limiting factor. The limitation is due to unavailability as well as low quality. Geographical coverage (access availability) will remain a major problem unless coverage by either fixed or mobile data communications is significantly improved.

Quality problems in the fixed telephone network cause actual modem speeds to remain rather low (often below 30 kbit/s). This is an increasing problem as an increasing number of Western Internet sites are designed for ADSL or cable TV modem access speeds (256 kbit/s and higher per user). Dial-up access (even a full 56 kbit/s) will soon be too slow for accessing many Internet sites.

Camnet's international bandwidth is presently 1 Mbit/s. With 2000 users, the bandwidth per user is a mere 500 bit/s. This means that some services or features are not effectively available, e.g. download of software may be impossibly slow during normal working hours. It should

be noted that even small offices (a few computers) in the industrialised world have dedicated access from their computer networks (LAN) at speeds higher than the entire Camnet international access bandwidth.

International access is expensive in Cambodia for several reasons:

- Traditionally high tariffs for leased lines (used as a Government cash cow) and correspondingly high charges for competitive VSAT connections; and
- Small operator size, resulting in little bargaining power.

Because of the present high charge levels for leased lines, significant user charge reductions are unlikely until a new tariff policy is implemented. A reduction in price of top level international Internet interconnectivity is not likely to be transferred to Camnet, as this is packaged with the leased line and VSAT services. The immediate impact would be to lower the cost to the intermediary (presently in Singapore or Hong Kong).

The situation is a vicious circle: high charges for leased lines (part of the concept of high international charges) result in low demand. Low demand results in little interest to invest in international high capacity optical fibre connections. The result is higher underlying costs, slow response times (turnaround time) on satellite circuits and thus low quality and high charges.

Unless improved, the overall outcome seems to be similar to many other developing countries: a widening digital divide. The situation is unfortunate.

7 List of References

All web site addresses were visited during May 2001.

1. BigPond: (Telstra): <http://www.bigpond.com.kh/>
2. Camintel: <http://www.camintel.com.kh/>
3. Camnet: (MPTC's subsidiary): <http://www.camnet.com.kh/>
4. Mobitel: <http://www.mobitel.com.kh/>
5. Open Forum: <http://www.forum.org.kh/eng>
6. Shinawatra: <http://www.thaicom.net/eng-information/cambodia.html>

1 Country data for Cambodia, mainly for years 1998 or 1999, main source: <http://www.odci.gov/cia/publications/factbook/geos/cb.html>

2 Interview with Mr. Chakrya Moa, Deputy Director, MPTC (Camnet).

3 Telecommunications operators: Number of subscribers, source: David Butcher & Associates

4 Summary of Internet operators, source: David Butcher & Associates

5 Further information on tariffs:
http://www.bigpond.com.kh/users/communications/Internet/internet_costs_in_cambodia.htm