Telecommunications in Africa: Small Island Developing States

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TELECOMMUNICATIONS IN AFRICA:
SMALL ISLAND DEVELOPING STATES

Ewan Sutherland

Abstract: Analysis of telecommunications policy and practice in Africa tends to focus on a few large markets (e.g., Egypt, Nigeria and South Africa), even though the lessons from these may not easily be scaled down for other countries. At the other extreme, the Small Island Developing States (SIDS) lie at the periphery, both geographically and in the sustainability and affordability of their services. They face disproportionate challenges in creating and maintaining properly functioning markets, not least as they are more susceptible to climatic and economic shocks. Like other African countries they too need to deliver services to businesses and citizens.

There are significant challenges in building links between islands and in connecting to the outside world. An undersea cable, while far from cheap, eases the recurring costs associated with satellite communications. However, obtaining access to undersea cables has been a mixture of geography, history and luck.

Some islands have benefitted from tourism. In particular this has brought significant roaming revenues for mobile operators and helped to enable the introduction of a second operator or the transition to third generation (3G) technology. Yet tourists have a very different idea of affordability from the permanent population so do not bring the same competitive pressures.

The reverse of this, is the importance of telecommunications for emigrants and those working temporarily overseas. Good communications ensures a better flow of remittances and increases the likelihood of people returning.

The case studies considered here are: Cape Verde Islands, Comoros, Mauritius, São Tomé & Principe and the Seychelles. In Cape Verde there is already an offer of triple play, including IP television (IPTV) and ADSL2+. It also has a fibre ring linking the various islands. In Mauritius there is one of the first 3G services in Africa. By comparison, São Tomé and the Comoros lag the rest of Africa, with slow growth in GSM.

Lessons can also be drawn from small island nations in other parts of the world, notably from the success of Iceland as a world leader in broadband. The scale and nature of the burden of regulation are explored by comparing it with the Faroe Islands and Malta. However, European examples must be thoroughly understood, before being properly localized in Africa.

Introduction

Most of the attention in telecommunications goes to the largest countries in Africa – Egypt, Nigeria and South Africa – even if the lessons from these may not be easily scaled down for smaller nations. By comparison, the Small Island Developing States (SIDS) are marginal cases, located on the periphery (see figure 1) and face special difficulties. Yet, vulnerability can be traded for the unconventional or the exceptional.1 The ways in which governments and operators in SIDS address their challenges may provide lessons which can be scaled up for larger countries.

The absence of economies of scale for an island state or for an individual island, the high costs of inter-island links and of links to the outside world combine with low levels of income, unequal income distribution and greater susceptibility to economic and climatic shocks. Together these accentuate the problems that telecommunications operators face elsewhere in Africa.

The African SIDS are much too small to be the “bottom of the pyramid”. The populations are very small, with only Mauritius reaching one million (see table 1). The Gross National Income (GNI) per capita varies greatly, though only Mauritius and Seychelles are over US$ 5,000.
Developing recent September problems evident. Traffic has been minimal fixed networks in Comoros and in São Tomé & Príncipe, while both Mauritius and Seychelles have relatively dense fixed and mobile networks. Despite its poor fixed network, São Tomé performs well in Internet access through public access centres. There have been some recent small declines in the fixed networks, as a result of the greater flexibility of mobile services for customers.

With the exception of Mauritius, the incumbent operators are very small on the more obvious measures (see table 2). The level of staffing is very small, presenting inevitable problems in terms of strategy, marketing and technological change. On the international traffic it is evident that Comoros and São Tomé & Príncipe have no undersea cables and thus have high call charges and markedly lower traffic volumes.

The United Nations (UN) has called for action both by and also in support of those countries most vulnerable to climate change – notably the SIDS. The scale of that change is constantly being assessed by the Intergovernmental Panel on Climate Change (IPCC).

Table 1  
Population, economic and ICT indicators for African SIDS $^2$

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>GNI</th>
<th>fixed</th>
<th>mobile</th>
<th>Internet</th>
<th>DOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Verde</td>
<td>518.6</td>
<td>2,590</td>
<td>13.8%</td>
<td>27.9%</td>
<td>6.4%</td>
<td>0.34</td>
</tr>
<tr>
<td>Comoros</td>
<td>613.6</td>
<td>1,140</td>
<td>2.3%</td>
<td>4.8%</td>
<td>2.6%</td>
<td>0.17</td>
</tr>
<tr>
<td>Mauritius</td>
<td>1,300.0</td>
<td>10,640</td>
<td>28.5%</td>
<td>74.2%</td>
<td>25.5%</td>
<td>0.50</td>
</tr>
<tr>
<td>São Tomé &amp; Príncipe</td>
<td>155.1</td>
<td>1,490</td>
<td>4.9%</td>
<td>19.1%</td>
<td>14.6%</td>
<td>0.15</td>
</tr>
<tr>
<td>Seychelles</td>
<td>85.6</td>
<td>14,360</td>
<td>23.8%</td>
<td>89.2%</td>
<td>35.7%</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Note: populations are in thousands, GNI Atlas US$ per capita PPP 2006.

Table 2  
Operator indicators for African SIDS (2005)$^3$

<table>
<thead>
<tr>
<th></th>
<th>CPV</th>
<th>COM</th>
<th>MUS</th>
<th>STP</th>
<th>SYC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff (full-time)</td>
<td>442</td>
<td>383</td>
<td>2,061</td>
<td>87</td>
<td>-</td>
</tr>
<tr>
<td>Fixed telephone lines</td>
<td>71,412</td>
<td>16,939</td>
<td>357,490</td>
<td>7,112</td>
<td>21,404</td>
</tr>
<tr>
<td>Public payphones</td>
<td>432</td>
<td>295</td>
<td>1,400</td>
<td>118</td>
<td>166</td>
</tr>
<tr>
<td>Annual investment (US$)</td>
<td>8,636,517</td>
<td>- 35,699,756</td>
<td>1,550,956</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Telephone traffic (minutes):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local (fixed)</td>
<td>55,000,000</td>
<td>-   1,583,419,008</td>
<td>17,014,000</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>International fixed:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- incoming</td>
<td>61,510,976</td>
<td>-   119,781,000</td>
<td>5,643,689</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>- outgoing</td>
<td>9,182,021</td>
<td>3,888,000</td>
<td>66,469,000</td>
<td>2,184,614</td>
<td>90,900,000</td>
</tr>
</tbody>
</table>

The teledensities are from ITU Africa ICT Indicators:
Digital Opportunity Index is from ITU/KADO Digital Opportunity Platform.
$^3$ ITU Telecommunication Indicators Database. Some Seychelles data has not been supplied to the ITU in recent years.
$^4$ UN envoy calls on vulnerable countries to prepare well for meetings on climate change. Press release: 14 September 2007. Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (New York, United Nations).
established by World Meteorological Organisation (WMO) and the UN Environment Programme (UNEP).\textsuperscript{5} Forecasts for the rise in sea level are in the range one to seven metres, potentially devastating for low lying islands. The Maldives and Nauru both face the possibility of total inundation.

Collectively, the SIDS have adopted the Mauritius Strategy and a programme of action for sustainable development.\textsuperscript{6} These addressed national and regional sustainable development considering the economic, social and environmental challenges in promoting sustainable development and eradicating poverty. They recognized the intensity and frequency of natural and environmental disasters and their increasing effects on SIDS which face disproportionately high economic, social and environmental consequences.

The general performance of national systems of governance is measured and ranked by the World Bank (see figure 2).\textsuperscript{7} The Comoros Islands fare badly given the political problems of recent years. The range of scores for rule of law and regulatory quality do not suggest that market entry in a regulated sector will be especially attractive.

\textbf{Figure 2} \hspace{1cm} \textit{Governance indicators 2006\textsuperscript{8}}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure2.png}
\caption{Governance indicators 2006}
\end{figure}

The World Bank also measures the ease or difficulty of “doing business” in countries (see figure 3). This ranks 178 countries – low numbers indicating a high rank – with Mauritius clearly the best performer of the African SIDS. Closing down a business appears to present severe challenges in most SIDS. On top of any difficulties in doing business, there are the complexities of the specific telecommunications regulatory regimes.

\textsuperscript{5} For the most recent report see: http://www.ipcc.ch/
\textsuperscript{6} http://www.sidsnet.org/dooshare/other/20050622163242_English.pdf
\textsuperscript{7} The values are neither raw scores, nor rank, but a percentile rank, with low values being the worst and high values being the best performances.
\textsuperscript{8} http://info.worldbank.org/governance/wgi2007/sc_country.asp
This paper identifies the specific challenges faced by SIDS, both for governments and for operators. Examples and issues are drawn from three small European island nations: Faroe Islands, Iceland and Malta. Then the African SIDS are analysed: Cape Verde Islands, Comoros Islands, Mauritius, São Tomé e Príncipe and the Seychelles. Governmental and regulatory structures are then reviewed. Finally, conclusions are drawn.

**Growth and scale**

Much of the success in the growth of mobile telephony in Africa has come from a small number of large operators with extensive geographical footprints:

- Etisalat
- France Telecom
- Millicom
- MTN
- Orascom
- Vodafone
- Zain

These firms have concentrated on large markets and on building contiguous footprints.

In the case of the SIDS the historic colonial links can still be seen:

- Africa Holding (88% Portugal Telecom and 22% Helios):
  - 40 per cent of CVT (Cape Verde)
  - 51 per cent of CST (São Tomé)
- Cable & Wireless:
  - 100 per cent of C&W Seychelles

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* Doing Business 2008 http://www.doingbusiness.org/
• France Telecom:
  o 40 per cent of Mauritius Telecom

Foreign-owned incumbent operators have usually been portrayed as highly defensive of their positions and have been accused of charging high prices that limit affordability, suppress demand and which consequently limit the need for investments, while repatriating the profits. Moreover, they have generally proved difficult either to regulate or to dislodge.

The effective operation of markets requires the real or, at least, the plausible threat of market entry. This is difficult to achieve in SIDS, where incumbent operators resist market entry and where sustaining revenue growth is difficult to achieve. Very small states contribute little to the customer growth strategies of the large operators and generally require special attention and expenditure. Competing with an operator that is vertically integrated into the owner of undersea cables compounds the problem of market entry.

Despite the economic and physical challenges, Mauritius and Seychelles have both succeeded in achieving rapid growth in mobile telephony, with impressive teledensities (see figure 4). They have, respectively, two and three operators, now with a 3G/UMTS service in Mauritius. Both countries benefit from large numbers of tourists, generating considerable roaming revenues for the operators. Some of the customers may not be Mauritian citizens or permanent residents, but tourists buying local SIM cards to save roaming bills. There may also be Mauritian citizens who are resident in other countries, but who retain a SIM card for regular visits home. Consequently, the saturation of the market may be less than the numbers suggest, requiring surveys to identify those groups that are not presently being served.10

Figure 4  The growth of mobile telephony in African SIDS11

The Cape Verde Islands and São Tomé e Principe showed much slower initial growth, with considerable delays even in getting starting, though both are now growing at

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11 ITU Least Developed Countries Indicators
respectable rates. It is the Comoros Islands that gives the most cause for concern, with a very small network and few customers.

Despite the lack of scale, all of the SIDS have achieved some growth in mobile telephony, with two having arrived at impressive teledensities and two more advancing at a rapid pace. The sustainability and affordability of the services are the next challenges the governments and operators face.

European small island states

Much of continental Africa draws lessons in policy and regulations from Europe, generally from the former colonial powers. These examples are often wrongly or inappropriately applied, in economic circumstances or in administrative traditions alien from the original. There has been a considerable divergence of paths since independence, with the European powers adopting liberalization and the objective of a single market. Notwithstanding these differences, there are examples of island nations in Europe that might, if carefully analysed and judiciously applied, provide lessons for African SIDS. A similar argument can be made for drawing lessons from the islands in the Caribbean and in the Pacific.

The European examples identified here are three small markets, the Faroe Islands (part of the Kingdom of Denmark), Iceland and Malta (see figure 5). Each has its own language: Faroese, Icelandic and Maltese.

There are quite different relationships with the 2002 regulatory package of the European Union (EU):

- Malta joined the European Union in 2004 and so is subject to the *acquis communitaire*, including the EU 2002 telecommunications directives and subsidiary legislation
- Iceland is a member of the European Free Trade Association (EFTA) and the European Economic Area (EEA), broadly applying the EU telecommunications regulations\(^\text{12}\)
- Faroe Islands, although associated with Denmark, did not join the European Union and has no legal obligations concerning telecommunications\(^\text{13}\)

Malta, although small, is not remote – indeed it is all too accessible to migrants from Africa seeking illegal entry to the European Union.\(^\text{14}\) A reflection of the short distances is that Vodafone has installed its own undersea cable linking Malta to Sicily.\(^\text{15}\)

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\(^\text{12}\) Along with other EEA states directives can be adopted by the Joint Committee and then transposed into national law.

\(^\text{13}\) It maintains a mission to the European Union.


\(^\text{14}\) See, for example, the speech of José Manuel Barroso (President of the European Commission) “Malta: at the heart of Europe’s past, at the heart of Europe’s future” Address to the Maltese Parliament, Valletta, 15 June 2007. Reference: SPEECH/07/400.

\(^\text{15}\) Vodafone selects Alcatel to supply a submarine network to link Vodafone Malta to Sicily. Vodafone press release. 22 August 2003.
There are several other island states, including the Isle of Man, Jersey, Guernsey and the Åland Islands that are not considered here. Additionally there are micro-states such as Liechtenstein and Andorra, while French telecommunications law covers Monaco and Italian law applies to San Marino and the Vatican City.

The populations of the three European island states are very small, as are their GDPs (see table 3). The economies of both the Faroes and Iceland are heavily reliant on fishing. The fixed teledensities are comparatively high and close to EU averages. Malta is clearly performing poorly in the adoption of Internet access.

Table 3  

<table>
<thead>
<tr>
<th></th>
<th>population</th>
<th>GNI</th>
<th>fixed</th>
<th>mobile</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faroe Islands</td>
<td>48,353</td>
<td>-</td>
<td>50.7%</td>
<td>89.4%</td>
<td>64.6%</td>
</tr>
<tr>
<td>Iceland</td>
<td>301,800</td>
<td>US$ 33,740</td>
<td>65.2%</td>
<td>110.6%</td>
<td>33.1%</td>
</tr>
<tr>
<td>Malta</td>
<td>406,000</td>
<td>US$ 20,999</td>
<td>50.2%</td>
<td>86.0%</td>
<td>17.9%</td>
</tr>
</tbody>
</table>

Note: GNI is ATLAS method US$ PPP 2006 per capita.

All three European island nations have shown strong growth in mobile telephony over recent years (figure 6). The Faroe Islands, despite being an extremely small market, have maintained a strong performance, comparable with the EU average.
In mid-2007, Iceland was ranked 6th in the OECD for broadband Internet access with nearly 30 lines per 100 population, following several years of strong growth (see figure 7). These are comprised largely of ADSL (97%), with some fibre to the home. However, the total number of lines was only 90,000 indicating that there are no economies of scale. The adoption of use of the Internet is very widespread through the economy and society.\textsuperscript{18}

There are two undersea cables, Farice,\textsuperscript{20} linking Tórshavn in the Faroes to Iceland and to London (though landing in the north of Scotland) and CANTAT-3, linking Canada, Iceland, Faroe Islands, Denmark, Germany and the United Kingdom. Thus, although remote, both Iceland and the Faroes have a good supply of international capacity and redundancy in the event of any cable breaks.

Iceland has a competition authority\textsuperscript{21} and also a telecommunications regulator the Póst- og fjárskiptastofnun (PTA).\textsuperscript{22} Its system of regulation is largely based on the Open Network Provision directives of the EU from the 1990s, judiciously modified to suit national circumstances.

\textsuperscript{17} ITU Telecommunication Indicators Database.
\textsuperscript{19} http://www.oecd.org/sti/ict/broadband
\textsuperscript{20} http://www.farice.is/
\textsuperscript{21} http://www.samkeppni.is/
\textsuperscript{22} http://www.pta.is/
In the Faroe Islands there are three interlinked authorities responsible to the Department of Trade and Industry and to the Føroya Lagting (parliament):  

- Competition Authority
- Post & Telecommunications Authority (FSO)
- Insurance Authority

The FSO comprises only a director, an engineer, two advisors and a small number of administrative staff.

There are three operators:

- Føroya Tele (Faroese Telecom)
- Kall
- Teletech

As a full member of the EU since May 2004, Malta has had to implement the regulatory framework of 2002. The Malta Communications Authority (MCA) has therefore defined markets, conducted analyses of the markets and then imposed remedies on dominant operators. It has a board of five and a substantial cohort of professional and administrative staff. This is a very heavy regulatory burden for such a small country, with relatively little flexibility or scalability in the EU directives.

One of the Maltese members of the European Parliament was a leading player in the adoption of the Roaming Regulation which significantly reduces both wholesale and retail prices. This is likely to affect the revenues of the two operators in Malta since there are many more visitors to the Islands who generate significant additional traffic.

The MCA has imposed the remedies necessary for local loop unbundling on the incumbent operator despite its view that there are no alternative operators seeking access to such loops. This appears, prima facie, to be disproportionate, wasteful and unnecessary. Multiple play offers from the incumbent Go Telecom (formerly the Maltacom Group) can combine GSM, UMTS and ADSL. Its principal rival is Vodafone which offers GSM, UMTS and, soon, WiMAX. The third operator Melita Cable offers television, Internet and telephony on its own fixed network.

The approaches to the creation, funding and staffing of NRAs are quite different in terms of their size, scope and resources. Malta has tackled the problem directly, with a large regulator to implement the full panoply of EU legislation with all the resources and expertise that calls for. Whereas, the Faroe Islands and Iceland have created minimalist institutions which have been forced to be judicious in their exercise of regulatory functions, ensuring maximum effectiveness.

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23 http://www.logting.fo/
24 http://www.kapping.fo/
25 http://www.fse.fo/
26 http://www.trygingarefirlit.gov.fo/
27 http://www.tele.fo/
28 http://www.kall.fo/
29 http://www.teletech.fo/
30 http://www.mca.org.mt/
32 http://www.go.com.mt/
33 http://www.vodafone.com.mt/
34 http://www.melitacable.com/
There are two French overseas dependencies or départements in Africa – La Réunion and Mayotte – that operate under the laws of metropolitan France. Thus it was the French regulator sitting in Paris hearing an application from the Conseil de la Réunion that applied the EU directives to the lower the price of access to the SAFE/SAT-3 undersea cable. It was recognized that the cable was not going to be duplicated because of the high cost and the low levels of demand. Moreover, the exclusive access of France Telecom to the cable represented a blockage in the achievement of a range of policy objectives. The French LRIC model Coût Moyen Increméntal de Long Terme (CMILT) was used, taking the investment in the landing station at €2.5M and the cable itself at €41.4M, with a cost of capital of 14.3 per cent. The regulator reduced the price for the route from La Réunion to France from €15,000 to €1,500 per Megabit per second per month. Its decision was affirmed by the Court of Appeal of Paris.

While these European examples are from economies that are considerably wealthier than the African SIDS, they face significant challenges in their remoteness, small populations, the absence of economies of scale and difficult decisions about the allocation of scarce resources. Consequently, they provide indications of possible policy options for African SIDS. The remarkable success of Iceland in broadband, in defiance of the absence of economies of scale, is very promising for other small markets, if the results can be replicated. The heavy burden of regulation adopted by Malta is clearly a cause for concern. A more selective approach, linked to a national strategy and assessments of the economic and social benefits of particular instruments creates a more proportionate system of regulation.

Tourism

There is a long tradition of islands as exotic locations in literature and, more recently, in movies, with the result that there is a strong attraction for tourists. There can also be significant revenue from the sales of stamps. Figure 8 shows the strong growth of tourism to some island nations. Whereas, São Tomé receives only 10-15,000 visitors a year and the Comoros only 20,000.

**Figure 8**  Number of tourist visitors to selected island states

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37 See, for example, William Shakespeare’s *The Tempest* or Daniel Defoe’s *Robinson Crusoe*.
38 Source: UN World Tourism Organisation.
Where an island nation with a population of a few hundred thousand receives the same number of visitors or substantially more in a year, it has a considerable effect on demand for telecommunication services. This is especially so since most visitors have high levels of disposable income. With tourists increasingly likely to remain in contact with their offices (e.g., with a hand-held device or lap-top computer for electronic mail) the traffic revenues should be significant.

Some SIDS have been able to use tourism as a way to achieve sustainable competition in telecommunications. The additional customer numbers and the high roaming revenues have allowed an increase in supply that has helped to meet demand.

However, tourism is an uncertain business, being subject to fashions and whims. For example, Iceland and Tonga have both been able to benefit from the interest in watching rather than killing whales. Tourism is increasingly vulnerable to concerns about the environmental effects of long distance air travel. More directly, warming of the oceans seems to be damaging coral reefs and thus removing one of the reasons to visit certain islands. Any significant rise in sea level may damage or destroy hotels and other centres of tourism.

**Republica de Cabo Verde**

The Cape Verde Islands (*Cabo Verde* in Portuguese) were first discovered in the fifteenth century by the Portuguese who settled there. The islands lie in the Atlantic Ocean off the coast of Senegal. Following political changes in Portugal, independence occurred in 1975. The official language is Portuguese, but the majority of the population speaks Crioulo, a local creole formed by a mixture of Portuguese and West African languages dating back to the fifteenth century.

Economic growth in recent years has been strong (see table 4), though there has also been significant levels of emigration partly the result of severe droughts. Remittances from expatriates can supplement up to 20 per cent of the GDP. Cape Verde graduated from the UN Least-Developed Country (LDC) status at the end of 2007, with the associated support mechanisms being phased out.\(^{38}\)

**Table 4**  
*Gross Domestic Product of the Cape Verde Islands* \(^{39}\)  

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (constant prices)</td>
<td>4.4%</td>
<td>5.8%</td>
<td>6.5%</td>
<td>6.9%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Market prices (CVE, Bn)</td>
<td>82.1</td>
<td>88.7</td>
<td>99.4</td>
<td>112.6</td>
<td>125.3</td>
</tr>
<tr>
<td>Current prices (U.S. dollars, Bn)</td>
<td>0.92</td>
<td>1.00</td>
<td>1.13</td>
<td>1.37</td>
<td>1.53</td>
</tr>
<tr>
<td>Per capita (constant prices, CVE)</td>
<td>175,749</td>
<td>186,370</td>
<td>204,912</td>
<td>227,995</td>
<td>248,905</td>
</tr>
<tr>
<td>PPP per capita (intl. dollar)</td>
<td>6,356</td>
<td>6,813</td>
<td>7,344</td>
<td>7,904</td>
<td>8,481</td>
</tr>
</tbody>
</table>

Note: Figures for 2006 to 2008 were estimated by IMF. CVE = Cape Verdian Escudo.

Efforts to use ICTs as a development tool began in the mid-1990s. A 1995 law defined the competencies and competition rules for the development of new services, though not specifically mentioning ICTs.\(^{40}\) However, in the same year another law gave Cabo Verde Telecom an exclusive concession for 25 years with the possibility for renewal for a

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\(^{39}\) World Economic Outlook Database, October 2007 (International Monetary Fund, Washington).

\(^{40}\) Law No. 500 of 1995.
minimum of a further 15 years.\textsuperscript{41} The Universidade Jean Piaget offers a undergraduate courses and a master’s degree in informatic engineering.\textsuperscript{42}

The Cape Verde Islands have shown modest growth in mobile teledensity (see figure 1), achieving a level not untypical for Africa. There are two GSM operators:

- CVMovel S.A. is the mobile operator of CVTelecom\textsuperscript{43}
- T+ Telecomunicações S.A.\textsuperscript{44}

CV Telecom offers both telephony and Internet access. However, the fixed telephone service is limited in scope, with a teledensity of only some 16 per cent, and still largely analogue (see figure 9). Further growth seems unlikely, given the interest in mobile telecommunications.

\textbf{Figure 9} \hspace{1cm} \textit{Fixed network of CV Telecom}\textsuperscript{45}

The total numbers of Internet access lines remains very modest, only some 1.5 lines per 100 population (see table 5). An ADSL service was introduced in 2004, after showing initially modest growth it became the dominant access technology during 2007. The slight drop in total broadband lines may be due to customers switching to sharing DSL lines. There are also a number of private Internet cafes offering wider access.

\textbf{Table 5} \hspace{1cm} \textit{Internet access from CV Multimedia}\textsuperscript{46}

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>dial-up</td>
<td>1,139</td>
<td>1,654</td>
<td>2,456</td>
<td>2,974</td>
<td>3,935</td>
<td>5,011</td>
<td>5,371</td>
<td>5,581</td>
<td>5,661</td>
<td>3,475</td>
</tr>
<tr>
<td>ADSL</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>283</td>
<td>937</td>
<td>1,814</td>
<td>3,833</td>
</tr>
<tr>
<td>Total</td>
<td>1,139</td>
<td>1,654</td>
<td>2,456</td>
<td>2,974</td>
<td>3,935</td>
<td>5,011</td>
<td>5,654</td>
<td>6,518</td>
<td>7,475</td>
<td>7,308</td>
</tr>
</tbody>
</table>

In September 2006, Cabo Verde Telecom (CVT) became the first company in the Portugal Telecom Group to launch an IPTV service.\textsuperscript{47} ZAP-TV was a triple-play offer, combining IPTV (21 television channels plus video on demand), broadband Internet access (ADSL2+) and fixed telephone services. The investment for IPTV was only around €2.8

\textsuperscript{41} Law No. 72 of 1995.
\textsuperscript{42} http://www.unipiaget.cv/
\textsuperscript{43} http://www.nave.cv/cvtelecom/
\textsuperscript{44} http://www.tmais.cv/
\textsuperscript{45} http://www.anac.cv/images/compendioestatistica2007versao5.pdf
\textsuperscript{46} Source: ANAC
\textsuperscript{47} http://www.portugaltelecom.pt/InternetResource/FTSite/UK/Canais/Media/DestaquesHP/iptvcapeverde.htm
In 2007, a rival IPTV service was launched by Cabo Verde Xinnuolide Serviços de Comunicações Electrónicas e Teledifusão Digital (CVXTV) a subsidiary of Xiamen Sinonets Electronics, a Chinese satellite television company.48

The political system is a multi-party democracy with a number of successful elections.49 There is a president and a prime minister with a cabinet of ministers.50 ICT policy has been co-ordinated by the Ministry of Infrastructure and Transport. The first National Information and Communication Infrastructure plan was finalised in 2001, with assistance from UNECA and IDRC.51

Responsibility for telecommunications has been assigned to the Agência Nacional de Comunicações (ANAC) created in 2006 with wide responsibility for telecommunications, spectrum, the .CV Internet domain name and the postal service.52

An undersea fibre ring has been constructed to link six of the ten islands (see figure 10). The first section (shown in red) was completed in 2001 with support from the Austrian government and the OPEC Fund. The second section, funded by CV Telecom, was completed in 2002.

Figure 10 Cape Verde fibre ring network 53
The Cape Verde Islands have the advantage of having an undersea cable. The Atlantis II cable links it to Brasil, Argentina, Senegal and Portugal, with onward connections to other cables and destinations.

The dependence on the cable was shown in April 2007, when Cape Verde suffered a loss of service for about two weeks.\textsuperscript{54} The Atlantis II cable was cut by a ship entering Praia harbour, disconnecting the islands from the rest of the world. There was a significant delay in the arrival of the special repair vessel from France. CVT had, after nearly one week, been able to reconnect to the Internet using satellite links, but at very slow speeds.

The islands also benefit from modest tourist roaming revenues. Although within a manageable distance of Europe in terms of travel and having a climate suitable for visitors at all times of the year, the total number of visitors is still modest, 198,000 in 2005. It faces competition from Madeira and, especially, the Islas Canarias, which are more commercialized, while continental African countries are attempting to attract more visitors. Unusually, there are data for roaming traffic which shows a ratio of 44:1 of inbound to outbound roaming (see table 6). Taking the 2005 data on tourists, some 198,000 visitors, it represents about 13 minutes per visitor over an average stay of 4 to 5 nights.

\textbf{Table 6} Roaming traffic to and from Cape Verde Islands (minutes) \textsuperscript{55}

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2,526,755</td>
<td>2,602,990</td>
<td>76,235</td>
</tr>
<tr>
<td>Inbound</td>
<td>2,460,218</td>
<td>2,491,174</td>
<td>30,956</td>
</tr>
<tr>
<td>Outbound</td>
<td>66,537</td>
<td>111,816</td>
<td>45,279</td>
</tr>
<tr>
<td>Net traffic</td>
<td>2,393,681</td>
<td>2,379,358</td>
<td>14,323</td>
</tr>
</tbody>
</table>

In keeping with its status of emerging from LDC status, Cape Verde has performed well in the area of telecommunications. It has a robust domestic fibre ring and undersea cable links to Europe and the Americas, it has seen significant growth in mobile telephony and in DSL. Nonetheless, it has significant challenges in reaching rural communities, often lacking in electricity and in topographically challenging locations.

\textbf{Union des Comoros}

The Comoros Islands lie in the Pacific Ocean between Madagascar and Mozambique. Three islands Grande Comore, Mohéli and Anjouan gained independence from France in 1975, though not the fourth, Mayotte. Independence has not been easy, with repeated disputes and \textit{coup d’état}, giving rise to a new constitution which gave each island its own president and administration, under a federal government.\textsuperscript{56} In early 2008, there was a dispute between the federal president and the president of Anjouan. This was mediated by the African Union, until it chose to switch to military action, with a celebration of the liberation of the island on 28 April 2008.\textsuperscript{57} It is a background of instability that does little

\textsuperscript{54} International phone and Internet service back to normal in Cape Verde. \textit{Asemana}. http://www.asemana.cv/article.php3?id_article=23813

\textsuperscript{55} Quadro nº6 – Tráfego de Roaming (minutos) http://www.anac.cv/images/compendioestatistica2007versao5.pdf

\textsuperscript{56} http://www.beit-salam.km/

\textsuperscript{57} http://www.beit-salam.km/article.php3?id_article=454
for business confidence, regulatory certainty or liberalization of the market.

The economy has shown only modest growth in terms of both real and nominal GDP (see Table 7). Most economic activities provide limited added value and productivity levels are low. There is minimal tourism and this seems unlikely to change, with the Comoran culture not being especially welcoming to hedonistic European tourists and not helped by the lack of political stability.

Table 7  Gross Domestic Product for Comoros 58

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (constant prices)</td>
<td>-0.2%</td>
<td>4.2%</td>
<td>1.2%</td>
<td>1.0%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Market prices (KMF, Bn)</td>
<td>143.6</td>
<td>153.1</td>
<td>158.1</td>
<td>167.7</td>
<td>180.5</td>
</tr>
<tr>
<td>Current prices (U.S. dollars, Bn)</td>
<td>0.36</td>
<td>0.39</td>
<td>0.40</td>
<td>0.44</td>
<td>0.47</td>
</tr>
<tr>
<td>Per capita (constant prices, KMF)</td>
<td>239,290</td>
<td>249,900</td>
<td>252,755</td>
<td>262,566</td>
<td>276,794</td>
</tr>
<tr>
<td>PPP per capita (intl. dollar)</td>
<td>1,900</td>
<td>2,002</td>
<td>2,048</td>
<td>2,078</td>
<td>2,133</td>
</tr>
</tbody>
</table>

Note: Figures for 2006 to 2008 were estimated by IMF. KMF = Comorian Franc.

In 2004, the government adopted an ICT infrastructure strategy to cover the period up to and including 2008.60 It sought to integrate ICTs into all aspects of social and economic life. It accepted the limited resources of the country and identified a long and daunting list of challenges to be faced. On practical measures the PTT was to be split, to create Comoros Télécom, duties on the import of equipment to be waived and a target set to half the cost of Internet access. The need for training in ICTs for decision makers was recognized. It was also recognized as necessary to improve the legal system and sector regulation, including liberalization of value added services. It was a very thorough and honest assessment.

The incumbent operator and monopolist is the Société Nationale des Télécommunications des Comoros (Comoros Télécom), created in February 2004 when it was split from the PTT.60 It launched a mobile network using GSM technology in 2004. The fixed network is very small and recognized as being in need of upgrading (see figure 11). Nonetheless, SNPT offers broadband ADSL services at 128k and 256k bps and a fixed wireless service of comparable speed, using cdma2000 technology. However, the number of customers is still very limited. Internet access is made expensive by the lack of an undersea cable, though this may be remedied by the EaSSy undersea cable.

58 World Economic Outlook Database, October 2007 (International Monetary Fund, Washington)
60 Ordonnance N°04/002/PR du 23 février 2004 http://www.snpt.km/
An effort was made by a commercial operator to use the Comoran E.164 code as the basis of a regional or global telephone service.

The political difficulties and their effect on the economy create a very weak base on which to build an enabling environment for telecommunications. The fixed network has very limited coverage and is of poor quality, with few incentives for SNPT to invest. To a limited extent, the introduction of mobile telephone has saved the day.

Republic of Mauritius

The Republic of Mauritius comprises the island of Mauritius (Île Maurice in French), plus St. Brandon, Rodrigues and the Agalega Islands. They are located in the Indian Ocean about 900 kilometres East of Madagascar. Settled by the Dutch in the seventeenth century, and named after a Stadtholder of the Netherlands, it later became a French colony before falling to the British during the Napoleonic Wars. Mauritius gained independence in 1968, becoming a republic within the Commonwealh.

A majority of the population are of Indian origin, having moved there under the British Empire. There are also substantial groups from continental Africa, Madagascar, France, Great Britain and China.

Mauritius is a parliamentary democracy based on the Westminster model. The head of state is the President. There is a unicameral parliament, the National Assembly, the result of a sequence of free elections. The head of government is the Prime Minister who chairs the Cabinet. The Minister for Information Technology and Telecommunications is a member of the Cabinet. Decisions by the Cabinet are published on its web site.

The economy is primarily comprised of sugarcane plantations, tourism, textiles and services. Mauritius has attracted considerable foreign direct investment in recent years and it is on this that the development strategy is focused. It is a centre for off-shore banking and commerce, primarily with India, South Africa and France. As a consequence, it has been able to sustain solid growth in recent years (see table 8).

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61 ITU Telecommunication Indicators Database.
62 http://www.gov.mu/portal/site/president
63 http://www.gov.mu/portal/site/pmosite
64 http://www.gov.mu/portal/site/telcomitv
65 http://www.gov.mu/portal/site/pmosite/menuitem.4ca0efdee47462e7440a600248a521ca/
The principal way in which diversification was introduced was through Export Processing Zones (EPZ). Merchants and manufacturers could circumvent quota systems by sending textile and factory workers to the countries that have quotas to export to the USA or to Europe.

Mauritius was relatively early in developing a national strategy for ICTs, or what in the early 1990s was termed an information-based economy, with public consultations in 1992 and 1993.

It then went through a sequence of such plans. The 1998 National IT plan saw the National Computer Board (NCB) launch projects in policy formulation, ICT awareness, human resources development, government computerization and standard setting. Increasingly, e-government was an area for the implementation of projects.

In October 2007, the government adopted the National ICT Strategic Plan 2007-11. Mauritius intends to build on its “kinship” links with China and India. The objectives included:

- 7 per cent contribution to GDP from offshore ICT services
- employ at least 29,000 qualified individuals
- employ at least 90% of those graduating in ICT
- double the number of foreign investors into the ICT sector

The Ministry of Information Technology & Telecommunications has overall responsibility for the sector. However, the Information and Communication Technologies Authority Act of 2001 created the national regulator, the ICT Authority. It is responsible for licensing, the national number plan and competition in the sector. Its board, appointed by the government, comprises a chairman, the Secretary for Home Affairs and five others, appointed after consultation with the ICT Advisory Council.

The current corporate plan of the ICTA covers the period 2005-08, setting out the vision and the following priorities:

- modern and secure communications infrastructure
- promoting competition
- safeguarding consumers’ interests

Liberalisation was introduced by reforms in 2003 in both domestic and international ICT services, including international voice telephony. Until 31st December 2002, Mauritius

**Table 8**

<table>
<thead>
<tr>
<th>Gross Domestic Product for Mauritius</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (constant prices)</td>
<td>4.7%</td>
<td>3.1%</td>
<td>3.5%</td>
<td>4.7%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Market prices (MUR, Bn)</td>
<td>166.28</td>
<td>179.84</td>
<td>194.50</td>
<td>222.67</td>
<td>251.01</td>
</tr>
<tr>
<td>Current prices (U.S. dollars, Bn)</td>
<td>5.93</td>
<td>6.12</td>
<td>6.29</td>
<td>7.03</td>
<td>7.49</td>
</tr>
<tr>
<td>Per capita (constant prices, MUR)</td>
<td>135,120</td>
<td>144,896</td>
<td>155,409</td>
<td>176,495</td>
<td>197,410</td>
</tr>
<tr>
<td>PPP per capita (intl. dollar)</td>
<td>11,887</td>
<td>12,539</td>
<td>13,281</td>
<td>14,153</td>
<td>14,954</td>
</tr>
</tbody>
</table>

Note: Figures for 2007 and 2008 were estimated by IMF. MUR = Mauritian Rupees.

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66 World Economic Outlook Database, October 2007 (International Monetary Fund, Washington).
70 http://www.gov.mu/portal/site/telecomit
71 http://www.icta.mu/
72 http://www.icta.mu/documents/CorporatePlan_ICTA.pdf
Telecom had an exclusive concession on most national and international services. MT is owned 40 per cent by France Telecom (through an investment vehicle, Rimcom) and 60 per cent by Mauritian institutions: the Government of Mauritius, the State Bank of Mauritius and the National Pensions Fund.

There are two licensed mobile operators, offering GSM in the 900 MHz band:

- Orange\textsuperscript{73}
  - launched January 1996
- Emtel\textsuperscript{74}
  - launched November 2004

The ICT Authority conducted a public consultation in 2004 on the introduction of 3G mobile services.\textsuperscript{75} There were three responses:

- Emtel – concerned about interference from pre-existing spectrum users, sought accelerated assignment of spectrum (at lower fees) and asked for compensation for the high risks by waiving of customs and other duties
- Rawat Group – argued for 3G for seamless access to multimedia content and also sought a waiver of customs duties and VAT be removed on mobile phones so they would be “more affordable”
- Multi Carrier (Mauritius) Ltd – concerning DVB-T

EMTEL launched a 3G service on 29th November 2004, the first UMTS service in Africa.\textsuperscript{76} Then in 2007 it upgraded this to HSDPA, allowing higher data transfer speeds, together with the launch of WIMAX which also offered higher speeds.

Mauritius has a landing station for the triple cable system WASC-SAT3-SAFE.\textsuperscript{77} This provides it with links to Africa, Europe, India and Malaysia. The ICTA regulated the prices for IPLCs in order to ensure all operators had equal access to the cable and the competitiveness of the economy.

Mauritius is peripheral geographically in two senses, it far from Africa, but it also sees itself as part of the Indian Ocean community and as part of Asia, given the ethnicity of its population. This means that it looks to Asia both for business and also for models of governance. Given its relatively remote location and lack of natural resources, the adoption of ICTs is a reasonable strategy to expand the economy and one that has achieved some success. As the new strategy recognizes, maintaining its position and making further progress is demanding, given the nations with which it must compete.

Republica Democratica de São Tomé e Príncipe

The two islands of São Tomé (Saint Thomas) and Príncipe (Prince) lie off the coast of Gabon in the Gulf of Guinea, they are separated by 140 kilometers. They were uninhabited until discovered by Portuguese explorers in the fifteenth century. Following the political revolution in Portugal, independence was granted in 1975. A system of

\textsuperscript{73} http://www.orange.mu/
\textsuperscript{74} http://www.emtel-ltd.com/
\textsuperscript{76} http://www.emtel-ltd.com/emtel-mauritius.php?category=50
\textsuperscript{77} http://www.icta.mu/
democratic government has operated since 1991, but has been challenged by internal disputes and failed *coup d’état* in 1995 and 2003.

The economy was historically based on slave labour in plantations, initially producing sugar and later coffee and cocoa. Even today exports remain heavily dependent on cocoa, with some copra, coffee and palm oil. Tourism has been a very modest source of income, though there is increasing investment.\(^7\) São Tomé and Príncipe not only requires a visa issued in one of its few consulates, but also yellow fever vaccination and preventative medicines for malaria.\(^8\) Recent discoveries of off-shore oil, though not yet exploited and with revenues not expected before 2014, offer some economic hope.

The IMF has reported significant progress in macroeconomic stabilization (see table 9).\(^9\) The growth of real GDP accelerated in 2006, while inflation had been declining and the fiscal deficit was significantly reduced. São Tomé and Príncipe reached the completion point under the enhanced Highly Indebted Poor Country (HIPC) Initiative in March 2007, thereby benefiting from significant debt relief.

### Table 9  Gross Domestic Product for São Tomé e Príncipe\(^{81}\)

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (constant prices)</td>
<td>4.8%</td>
<td>5.4%</td>
<td>7.0%</td>
<td>6.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Market prices (STD, Bn)</td>
<td>1,061</td>
<td>1,189</td>
<td>1,526</td>
<td>1,954</td>
<td>2,297</td>
</tr>
<tr>
<td>Current prices (U.S. dollars, Bn)</td>
<td>0.108</td>
<td>0.114</td>
<td>0.123</td>
<td>0.142</td>
<td>0.154</td>
</tr>
<tr>
<td>Per capita (constant prices, STD)</td>
<td>6,935,560</td>
<td>7,594,527</td>
<td>9,560,321</td>
<td>12,001,575</td>
<td>13,831,697</td>
</tr>
<tr>
<td>PPP per capita (intl. dollar)</td>
<td>2,860</td>
<td>3,040</td>
<td>3,290</td>
<td>3,507</td>
<td>3,708</td>
</tr>
</tbody>
</table>

Note: Figures for 2006 to 2008 were estimated by IMF. STD = Sao Tome Dobra.

The IMF had noted that regulatory reform was needed to reduce the cost of investment and doing business. In particular, it was required in the financial sector with a strengthening of banking supervision. Another requirement was the improvements of infrastructure.

The World Bank governance indicators measure the absolute and relative performances of countries (see figure 12). The poor scores on government effectiveness, control of corruption and rule of law, indicate areas where efforts have to be focused, as also on the quality of regulation. In 2006 the UN Convention Against Corruption was ratified by São Tomé and Príncipe, with an undertaking to adopt legislative and administrative measures required to prevent, to investigate and to repress corruption.\(^2\) Like most LDCs and especially SIDS, São Tomé faces serious shortages of skills in the public sector and government. It is being supported in these areas by the UN Development Programme.\(^3\)

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\(^7\) See the tourist authority [http://www.saotome.st/](http://www.saotome.st/)

\(^8\) An anti-malaria campaign launched in 2003 involving education, fumigation and bed nets has reduced malaria child morbidity from 86 per 10,000 in 1999 to 60 in 2004.


\(^81\) World Economic Outlook Database, October 2007 (International Monetary Fund, Washington).


\(^83\) [http://www.uns.st/undp/fr/fiches.html](http://www.uns.st/undp/fr/fiches.html)
The head of state is the president.\textsuperscript{85} There is a unicameral National Assembly, most recently elected in 2006.\textsuperscript{86} The head of government is the prime minister who nominates ministers to be appointed by the President. Telecommunications is the responsibility of the Ministério do Planeamento e Finanças.\textsuperscript{87}

Unusually, there was no National Information and Communication Infrastructure (NICI) plan developed for São Tomé.\textsuperscript{88} However, there has been significant progress towards the ending of the telecommunications monopoly of the incumbent operator, the Companhia Santomense de Telecomunicacoes SARL (CST).\textsuperscript{89} It is 51 per cent owned by Africa Holding (Telecom Portugal Group) and 49 per cent by the government of São Tomé.

The creation of a regulatory regime and the renegotiation of the CST concession was backed by the IMF and funded by the World Bank, with support from foreign consultants. The eventual result was the creation of the Autoridade Geral de Regulação (AGER), responsible for electricity, posts, telecommunications and water.\textsuperscript{90}

A new Telecommunications Law was adopted in July 2004.\textsuperscript{91} This defined the conditions for the establishment, management and operation of telecommunications networks and services. Then in 2005, a law-decree created the AGER, which began operations one year later.\textsuperscript{92} A primary task for the new regulator was to end the monopoly of CST and to do so it had first to convert the existing concession into fixed and mobile licences. That process was completed in 2007.\textsuperscript{93}

\textsuperscript{84} http://info.worldbank.org/governance/wgi2007/sc_country.asp
\textsuperscript{85} http://www.presidencia.st/
\textsuperscript{86} http://www.parlamento.st/
\textsuperscript{87} http://www.minfin.cv/
\textsuperscript{88} http://www.uneca.org/AISI/nici/country_profiles/Sao%20Tome%20and%20Principe/saopol.htm
\textsuperscript{89} http://www.cstome.net/
\textsuperscript{90} http://www.ager-stp.org/
\textsuperscript{91} Lei n.º 3/2004 Lei que define as regras aplicáveis ao estabelecimento, à gestão e à exploração de redes de telecomunicações nacionais e ao fornecimento de serviços de telecomunicações.
\textsuperscript{92} Decreto-Lei n\textnumero 14/2005 de 24 de Agosto.
\textsuperscript{93} Decreto n.º 27/2007. Atribui licença de estabelecimento e de exploração de uma rede de telefone fixa à Companhia Santomense de Telecomunicações (CST).
While the growth of mobile telephony began later than in most African countries it has taken off in the last two years (see figure 2). In December 2007, AGER approved the decree for the licensing of a second GSM operator, which should stimulate further market growth.\(^\text{94}\)

A major problem has been that São Tomé and Príncipe lacks an undersea cable, having been by-passed by SAT-3. Given the small volumes of traffic it seems unlikely that any future cable would land there. Thus the only international connection is a satellite earth station linked to Intelsat.

The Internet domain name is .ST, managed by Aguinaldo Salvaterra of Tecnisys, with the technical operations performed by Bahnhof of Sweden.\(^\text{95}\) The government has sought to take control of the domain name which is presently used outside São Tomé with other meanings, such as Sex Telephony or simply STyle. These domain names can be purchased on-line from NIC at prices far from affordable in São Tomé.\(^\text{96}\) Bahnhof ST has an operation on the islands, as an Internet Service Provider Internet technology and web-hosting.

Inevitably, given the lack of resources and the small size of the market, the scope for initiatives has been limited. Without an undersea cable, the costs of international links for voice telephony and the Internet are unavoidably high. Nonetheless, São Tomé and Príncipe has made significant progress in mobile telephony. Its challenge is now to sustain this and to introduce a second operator, then to extend its success to broadband Internet access. Improvement of government and regulatory systems are a more general matter, not confined to telecommunications where further progress is required. However, if it can prove successful, AGER could become an example to other sectors.

Republic of Seychelles

The Republic of Seychelles is an archipelago of some 155 islands in the Indian Ocean, lying northeast of Madagascar. The first record of the islands was by Vasco da Gama in 1502, though they were named by the French, after a minister of finance. They were ceded to Great Britain during the Napoleonic wars, gaining independence only in 1976.

From 1979 to 1991 Seychelles was a one party socialist state, thereafter becoming a multi-party democracy. The head of state is the President who holds several ministerial portfolios, there being no prime minister.\(^\text{97}\) There is a unicameral system of government, the National Assembly.\(^\text{98}\)

As indicated above (see figures 2 and 3), Seychelles has scored highly in assessments of its governance and doing business. It has been very successful in attracting tourists and related investment, though the cyclicality of this activity has had adverse effects on the economy when there is a downturn in tourist numbers. Nonetheless, the recent growth has been strong and the level of GDP per capita is impressive (See table 10).

\(^{94}\) Decreto n.\(^\circ\) 34/2007. Aprova o Regulamento ao concurso público para atribuição da Segunda Licença de Estabelecimento e de Exploração de uma Rede de Telefonia Celular de Norma GSM.
\(^{95}\) In Sao Tome see: http://www.bahnhof.st/
In Sweden see: http://www.bahnhof.se/
\(^{96}\) See NIC at http://www.nic.st/
\(^{98}\) http://www.nationalassembly.gov.sc/
Table 10  
**Gross Domestic Product (GDP) for Seychelles**

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth (constant prices)</td>
<td>-2.9%</td>
<td>1.2%</td>
<td>5.3%</td>
<td>6.1%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Market prices (SCR, Bn)</td>
<td>3.85</td>
<td>3.97</td>
<td>4.28</td>
<td>4.74</td>
<td>5.66</td>
</tr>
<tr>
<td>Current prices (U.S. dollars, Bn)</td>
<td>0.70</td>
<td>0.72</td>
<td>0.78</td>
<td>0.73</td>
<td>0.70</td>
</tr>
<tr>
<td>Per capita (constant prices, SCR)</td>
<td>39,163</td>
<td>39,602</td>
<td>40,933</td>
<td>43,413</td>
<td>46,157</td>
</tr>
<tr>
<td>PPP per capita (int'l. dollar)</td>
<td>17,784</td>
<td>18,564</td>
<td>19,794</td>
<td>21,535</td>
<td>23,293</td>
</tr>
</tbody>
</table>

Note: SCR = Seychelles Rupee. Figures for 2007 and 2008 were estimated by IMF.

The Department of Information Communication Technologies is under the Ministry of National Development. There is no separate regulator, but instead a Policy and Regulatory Affairs Section with Strategic Development and Compliance Units.

A national ICT strategy was approved by the government in September 2007 and formally launched the next month by the Minister. This followed extensive consultations through the National Information and Communications Technology Consultative Committee (NICTCC), with assistance from COMESA, the Indian Ocean Commission and the Commonwealth Secretariat.

The National Information & Communications Technology Policy (NICTP) sets out to ensure that the Seychelles can develop as a “leading ICT hub” applying best practices in all sectors of the economy. In achieving this it faces significant competition within the Indian Ocean region, notably from Mauritius and the Maldives. Although, its strategy indicates concern for all the correct areas it lacks anything specific to Seychelles. Indeed, there is little in the strategy with which anyone might disagree. It will be in the implementation that it must look for its success.

Mobile telecommunications has been very successful, reaching a nominal level of 90 customers per 100 population, though the real use will be substantially less than this. There are three GSM operators:

- Cable and Wireless Seychelles
  - since November 1995
- Airtel part of the Bharti Group
  - since December 1998
- Smart Com (MediaTech International Limited, Lebanon)
  - since February 2006

Airtel additionally launched a UMTS network in December 2007.

The following service providers offer Internet access:

- Atlas Seychelles

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99 World Economic Outlook Database, October 2007 (International Monetary Fund, Washington).
100 http://www.ict.gov.sc/
103 Source: GSM Association.
104 http://www.cv.com/seychelles/
105 http://www.airtel.sc/
106 http://www.smartcomgsm.com/
107 http://www.seychelles.net/
• **ADSL Internet access (256k, 512k, 1M bps)**
  • **Cable and Wireless**
    - ISDN and DSL/cable modem
    - VSAT
  • **Intelvision**
    - HFC cable modem (256k, 512k, 768k and 1M bps)
  • **Kokonet**
    - dial-up and ISDN Internet access
    - line of sight wireless Internet access
    - leased line Internet access

While Seychelles has performed well both at a general economic level and in mobile telephony, there is little that offers itself as examples of global best practice. For example, there is surprisingly little in the way of published statistics. Nonetheless, it has delivered relatively consistently in recent years.

**Governance, strategy and regulation**

The systems of governance adopted in the five SIDS are quite different and have achieved varying degrees of effectiveness at the political and economic levels. The areas in which they can make improvements are easier to identify than making the necessary changes. Nonetheless, considerable progress has been made and more appears likely. The country which has struggled most at this level has been the Union of Comoros which has not yet managed to achieve political stability, despite assistance from the African Union. In general good systems of governance are in place, as are mechanisms to improve them.

The African SIDS have developed strategic approaches to the deployment of ICTs. Prior to WSIS this was supported by aid from Canada and facilitated by UNECA. However, all states have been forced to take strategic decisions, if only because of the lack of resources and limited choices. Although infrastructure competition is highly desirable, creating conditions where there is a reasonable business case for the recovery of the necessary investments is complex and, unavoidably, risky. It will be some time before the survival of competition in the mobile markets can be judges sustainable.

Considerable work has been undertaken to develop the use of ICTs in the detection of earthquakes, tsunamis and extreme weather. Linked to this are telecommunications systems, such as SMS and cell broadcasting, to alert people to take appropriate safety measures.

The existence of a regulator is now so commonplace that few countries lack one. The most recent small island nation to announce the creation of an NRA was Montserrat. In theory there should be significant resistance to this sort of innovation from the administrative and political classes, but this has seldom been a problem. Somehow the shortages of resources and expertise have been overcome.

The costs of running a regulatory authority, both the direct expenses and the opportunity costs, are considerable. If there are only to be two, three or four operators, the tasks for a regulator are necessarily limited. Some island states have generally managed to create regulatory structures that are cost-effective, for example, a multi-sectoral regulator or

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108 http://www.cw.com/seychelles/
109 http://www.intelvision.sc/
110 http://www.kokonet.sc/
bundled with e-government. A few have adopted models that appear expensive and overly bureaucratic, notably Malta, which is applying the full European Union regulatory package in a small market with three principal operators. Physical and cultural proximity allow the countries of the East Caribbean to share some regulatory functions, a transnational approach that most countries would find unpalatable. One way in which the lessons from the different experiences could be drawn together would be through a programme of peer reviews.

The operation of a regulatory system places a heavy burden on governments. The opportunity costs of deploying skilled personnel on regulation have to be weighed against their use in more productive activities. There needs to be enough regulation of a high quality to overcome concerns about stranded assets. It is the judicious application of regulation within a strategic framework, on those few issues of importance that have brought success.

Conclusion

As everywhere in Africa the level of demand for telecommunications in the five African small island developing states is considerable – always provided that prices are affordable. In addition to the problems faced by small nations in continental Africa, there are the high costs of backhaul to the outside world, plus the costs of links between islands. These have to be recovered from markets that are small, poor and fragile. Some countries are unfortunate in not having and not being able to pay for an undersea cable – even those with such a cable may struggle to extend connectivity to all of their own islands.

Three of the African SIDS have significant levels of tourism. One benefit is that it generates roaming revenues for mobile operators that supplements domestic demand, sometimes to a very significant extent. This may even justify the introduction of an additional operator to bring the first competition. There may also be a significant role played by emigrants who periodically return home, though this requires more work to determine the scale of any effect.

Formal ICT strategies appear to be a mixed blessing. They are a useful means of stock-taking, but quickly become a burden and can be left too long for review. They may also be so general as not to provide sufficient guidance for decision making. Force majeure, with few choices and limited resources, efforts come to be concentrated on the key issues. A thorough review of the ICT strategies and their links to economic strategies is required, one that includes all SIDS.

Even on the geographical margins there is evidence of the techno-enthusiasm of operators. 3G services have been available in Mauritius since late 2004 with UMTS and, since 2007, with HSDPA. Perhaps this was initially directed at tourists, in pursuit of data roaming revenues. In the Cape Verde Islands there is now a triple play offer with fixed telephony, Internet access and IP television. The levels of demand and the sustainability of these services require careful attention.

Whether in business or in systems of governance, these can more easily be scaled up, than scaled down. What will work in Nigeria may not be applicable in the São Tomé e Príncipe, whereas what works in the Cape Verde Islands could be made to work in Egypt.