



Timor-Leste

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INTRODUCTION

The official name of Timor-Leste is República Democrática de Timor-Leste (RDTL) or Democratic Republic of Timor-Leste. The country declared its independence in May 2002 after a brief United Nations Transitional Administration (UNTAET) following the Popular Consultation (referendum) in August 1999.

Since then Timor-Leste has developed in every sector. In 2002, the Government adopted its first National Development Plan titled *East Timor 2020 — Our Nation, Our Future*. In the telecommunications sector, Timor-Leste has the following vision: ‘We want good communication facilities throughout the country, with access to postal services, telephone, Internet, radio and television’ (Government of Timor-Leste 2002). It should be noted that practically the entire telecommunications network was destroyed during the violence that erupted following the 1999 referendum. Thus, to achieve its vision for the telecommunications sector, the government of Timor-Leste has focused on restoring telecommunications and postal services, establishing better communication facilities for remote areas, and providing modern telecommunication systems at the national level.

However, in 2006 the country’s development was again put on hold due to the violence triggered by the military crisis.¹ Following the Legislative Election in June 2007, President Jose Ramos Horta appointed a new Government of Timor-Leste in early August 2007. The programs of the newly formed government under Prime Minister Jose Alexander Gusmao (popularly known as Xanana Gusmao) were approved by the National Parliament in October 2007. The telecommunications sector is included under ‘Infrastructure and Enhancing the Quality of Life’.

The information and communication technology (ICT) sector has great potential to support the national development process.

Total population	1.1 million (2005)
Literacy rate	50.1 (2005)
GDP per capita	USD 358 (2005)
Computers per 100 inhabitants	NA
Fixed-line telephones per 100 inhabitants	0.24
Mobile phone subscribers per 100 inhabitants	10
Internet users per 100 inhabitants	1
Domain names registered under .tl	20
Broadband subscribers per 100 inhabitants	NA
Internet domestic bandwidth	NA
Internet international bandwidth	11 Mbps (2006)

(Sources: ARCOM 2006; UNDP 2008)

But greater advocacy efforts are required to promote better understanding of this potential among the government, members of Parliament, and the general public. The lack of a proper legal infrastructure for the ICT sector reflects the lack of an integrated national policy in this area. The sector is also characterized by very limited human resources and inadequate ICT and power supply infrastructure in the country’s capital Dili and especially in the rural areas where power and telecommunications infrastructure are non-existent.

TECHNOLOGY INFRASTRUCTURE

Timor Telecom, a private company owned by Portuguese Telecom International (PTI), is the only telecommunications operator in Timor-Leste. It started operations in March 2002 and provides all IT and telecommunications services in the country. Customers have been complaining about its pricing regime and the low quality of service, but Timor Telecom counters this criticism by pointing out that services are expensive due to the high taxation system² and the provision of power to all of its operations in Timor-Leste. In 2007 approximately 50 generators were used to provide energy to all of Timor Telecom’s sites (Timor Telecom 2007), resulting in very high capital and operational costs. Timor Telecom has also argued that it has not increased prices for its services since 2003, while the cumulative inflation during 2003–2007 has been approximately 20 percent (Timor Telecom 2007).

As of January 2008, there were 2,457 fixed Public Switched Telephone Network (PSTN) subscribers in operation in Timor-Leste, corresponding to a penetration rate of less than 0.25 percent.

However, this number represents a 25 percent increase from the number of services (1,970) at the end of 2003. Most of the services are used by government institutions, international non-government organizations (NGOs), and other international institutions. And most services are located in Dili. There are few Integrated Service Data Network (ISDN) services in operation.

At least two factors would account for the very low access to fixed phone services. First, the network is very limited both in Dili and the districts.³ Timor Telecom has not expanded the fixed telephone networks. Second, Timor Telecom is charging almost the same rate for fixed line service as for mobile service. Thus, most people opt to use mobiles rather than the fixed telephone services, for flexibility, and better service and mobility.

As of February 2007 Timor Telecom had 78,215 mobile telephone subscribers, compared to 20,000 customers in March 2003 when Timor Telecom first started its operations in Timor-Leste. However, the current total represents approximately less than 8 percent of the population. While the network coverage is around 68 percent of the territory (Timor Telecom 2007), the real access rate is much lower due to very limited access to electricity in the rural areas. In other words, while mobile services may be available in many places, few people actually avail themselves of the service because they do not have electricity.

The high cost of mobile service is another reason for the low mobile penetration rate. A World Bank report released in August 2007 predicts that the penetration of mobile services would be even greater (up to 200,000) if prices were to be brought down (World Bank 2007).

Currently, there are two Internet service providers (ISPs) — Timor Telecom and iNet. The latter is owned by an Australian and it began its operations at the time of the UNTAET in 1999–2002. iNet is only a sub-ISP since all its lines are leased from Timor Telecom. This arrangement makes Timor Telecom the sole ISP in the country.

Both Timor Telecom and iNet provide Internet dial-up, dedicated Internet access, and short messaging service (SMS) via the Internet. They also operate several Internet cafés.

Internet access in Timor-Leste is extremely expensive relative to the average income of the people and compared with the cost of Internet access in neighbouring countries. In 2007 Timor Telecom charged a connection fee of USD 35 and a monthly line rental fee of USD 5 for its dial-up services. The peak per minute usage charge was USD 0.079, and the non-peak per minute charge was USD 0.019. For dedicated Internet access, Timor Telecom charges an activation fee of USD 500 and a monthly fee ranging from USD 500 for 64 Kbps and up to USD 3,450 for 512 Kbps. Considering the fact that almost half of the population earns about 50 cents per day and the average monthly salary is less than USD 250, it is almost impossible for the majority of the people of

Timor-Leste to enjoy Internet access. In fact, in 2007, the number of Internet subscribers in Timor-Leste was only around 1,500. Most of these are government offices, international NGOs, private enterprises, and other international institutions. There are some schools and NGOs that currently have Internet access due to financial support from donors. If the rates remain at current levels, then Internet access in Timor-Leste will most likely remain extremely low in the future.

UN agencies, embassies, some government offices, and some international NGOs operating in Timor-Leste have their own private satellite connection via Very Small Aperture Terminal (VSAT). There are also around 15 Internet cafés around Dili and in the districts. The total number of Internet users in Timor-Leste is estimated to be 10,000, or less than 1 percent of the population.

According to the Autoridade Reguladora das Comunicações (ARCOM), by 2006 the total international Internet bandwidth in Timor-Leste was 11 Mbps, of which the outgoing bandwidth was 4 Mbps (up from 1 Mbps in 2003) and the incoming bandwidth was 7 Mbps (compared to 2 Mbps in 2003). Half of the outgoing bandwidth is reserved for government institutions.

The official country domain name is .tl. This used to be .tp, for Timor-Portuguese (East Timor’s formal name as a Portuguese colony). Some organizations, such as Timor Telecom (www.timortelecom.tp), are still using the .tp domain.

KEY INSTITUTIONS DEALING WITH ICT

Under the newly formed government, the Department of Transport and Telecommunications, which was responsible for telecommunications policy, has been merged with other sectors to form a new Department of Infrastructure, covering public works, electricity, water and urban planning, telecommunications, and transportation.

The ARCOM or the Communications Regulatory Authority was established in 2003 to regulate, supervise, and represent the telecommunications sector (ARCOM Statute Chapter 1 Section 1.2). However, despite the stipulation (in Decree Law No 12/2003, Section 5.2) that the ARCOM’s Board of Directors be appointed within 90 days of its entry into force, the Board of Directors has still not been formed and the ARCOM is still operating as a government sub-department. Being financially dependent on subsidies from the government limits the ARCOM’s daily functions as a supposedly independent telecommunications regulator. In addition, although the ARCOM is supposed to facilitate the registration of complaints by consumers, there are no effective means for this and it is unlikely that many East Timorese

even know about the ARCOM. Its website (www.arcom.tl) is under construction, and online registration of complaints and other online services will benefit only the few who have access to the Internet.

The Comissão Consultativa (Consultative Body), consisting of representatives of the government, operators, and consumers, is mandated to provide guidance and advice to the ARCOM. But this has also not yet been formed, in spite of the stipulation (in Decree Law No. 11/2003) that the Consultative Body be constituted by mid-2003.

Timor Telecom is the only telecommunications carrier in Timor-Leste. It entered into a concession contract with the government in July 2002 and started operations in March 2003. The concession contract gives Timor Telecom exclusive rights to provide telecommunications infrastructure and services until 2018, with the exception of broadcasting and Internet services, which can be provided by other operators and by Timor Telecom. In 2007, Televizaun de Timor-Leste (TVTL) or Timor-Leste’s Television, the national broadcaster, entered into an agreement with an Indonesian satellite provider for its transmission carrier services, rather than using Timor Telecom.

The Australian-owned iNet is the only other ISP in Dili. Established in 2003, iNet has to use infrastructure provided by Timor Telecom, including Internet connectivity and leased lines. However, in 2006, iNet was refused supply of analogue leased lines by Timor Telecom. Despite a directive by the ARCOM, Timor Telecom has not resumed the provision of analogue leased lines to iNet and iNet has taken legal action against Timor Telecom.

Connect East Timor (CET, www.connecteasttimor.com) is a community-based initiative that seeks to address the lack of basic communications facilities in rural and remote areas. By installing very high frequency (VHF) services, CET estimates that approximately 30,000 people in rural and remote areas had access to its services by the end of 2007 (CET 2007). As there is no interconnect agreement with Timor Telecom and in many cases, no infrastructure to interconnect with, the connectivity of the VHF services is limited to the reach of the radio system, which varies with topography and which also requires an expensive transceiver. This system can nevertheless be useful for communication between remote villages (see ‘Connect East Timor Radio Communication Pilot Project in Atabae and Lacluta Sub-districts’).

Info Exchange East Timor (Info Timor) is a not-for-profit enterprise with a vision to assist in the rebuilding of Timor-Leste using information communication technology to deliver skills development, education, and employment through the creation of a sustainable social enterprise in partnership with the Dili Institute of Technology (www.dit.east-timor.net), Infoexchange

Australia (www.infoexchange.com.au), and the Government of Timor-Leste.

Timor-Leste ICT Association (ICT-TL) was founded in November 2007 by a group of ICT activists to develop the professional skills of its members, to promote ICT applications to support the national development process, and to promote the interests of consumers in the ICT sector in Timor-Leste.

ICT-RELATED INDUSTRY

Because it is a new country, Timor-Leste’s ICT industry is also at a very early stage of development. At the time of writing this chapter, there is no software or hardware company with an office based in Timor-Leste.

According to the ARCOM, the total revenue from all telecom services in 2006 was just above USD 23 million. Of this, revenue from fixed-telephone services was approximately USD 4 million while revenue from mobile services was about USD 16.8 million. The rest was revenue from data transmission, including leased circuits.

ICT imports of hardware and software are mainly from Indonesia, Australia and Singapore, and ICT services are provided mainly by foreign companies. Since Timor-Leste does not have copyright laws, pirated compact disc/digital versatile discs (CD/DVDs) and computer software, including games, are sold in stores without restriction. Most of the pirated CDs and DVDs are imported from Indonesia and Malaysia.

KEY ICT POLICIES AND PROGRAMS

The 2007–2012 program of the government elected in 2007 includes the following targets (Government of Timor-Leste 2007):

1. Improve the efficiency of the ARCOM, which must operate in an autonomous fashion and according to the regulations applicable to a public institution in its tasks of approving all communications regulations and inspecting in an appropriate manner the market’s agents;
2. Promote the establishment of monitoring stations of radio frequencies throughout the national territory;
3. Evaluate contracts signed with Timor Telecom and study the monopoly system in the area of telecommunications, assessing whether a more competitive environment would be of benefit to the Timorese;
4. Connect additional telephone lines to the districts and increase the coverage area;
5. Increase the number of fixed-telephone lines;
6. Disseminate Internet access throughout the country, interconnect via a data network all of the government departments

Connect East Timor Radio Communication Pilot Project in Atabae and Lacluta Sub-districts

Connect East Timor (CET) is a community-based campaign that seeks to address the lack of telecommunications infrastructure in rural and remote areas of East Timor. CET's campaigns in East Timor and Australia are undertaken by PALMS Australia, an Australian, non-government, international aid agency.

Access to basic telecommunications services in rural and remote areas of East Timor is crucial. It would significantly improve all types of services for people living in rural and remote areas, particularly in the delivery of health and education services for children. Among the services that can be delivered over a basic village radio system are: basic emergency calls (many women die in childbirth because help reaches them too late); expert medical advice and support to community health workers; better coordination of government services at the sub-district and village level; training for health and educational workers; school on the air services to assist with the delivery of school programs in remote villages where there is no teacher (currently children in these villages walk many kilometres to school each day, or board away from their families during the week, or simply do not go to school); support for commercial activities in rural areas; better coordination of family and community activities.

In June 2005, Connect East Timor was successfully piloted in two sub-districts — Balibo and Lacluta. About 20,000 people are being provided with affordable access to basic, solar-powered communications facilities. Specifically, the project has enabled the following:

1. The Balibo Sub-district Administrator's office is networked to eight major villages via a new radio signal repeater.
2. The Lacluta Sub-district Administrator's office is linked to the District Administrator in Viqueque and networked to seven major villages via a new radio signal repeater constructed on a bare site. Two villages that were only accessible on foot had radio equipment 'back-packed' to them.

The local leaders of Atabae sub-district are very happy with the project and in a letter to the Minister of Telecommunications they have said that, 'this radio system has become very important for us and it would be very difficult for us if the radio would no longer be available. It is now a big part of our daily life.'

(Source: Connect East Timor 2007)

- and agencies, and promote the use of communication through Voice over Internet Protocol (VoIP) on that network; and
7. Ensure the coverage of radio communications in the urban areas.

Under the current telecommunications regime, most of these programs can be achieved by the government only through cooperation with Timor Telecom. However, based on the operations of both the government and Timor Telecom over the last five years (2003–2008, which is a third of the contract with Timor Telecom), it seems unlikely that these programs will be realized in the near future. Timor Telecom seems to be focusing its business operations in the capital, Dili.

Timor Telecom should continue to increase its fixed-telephone network coverage, but at the same time the government of Timor-Leste should fulfil its obligations of increasing electricity services in the rural areas and greater decentralization of power to the local administrations to foster economic activities outside the capital city.

Apart from the above, the government is also preparing specific ICT programs for the coming years. These include a government integrated network to interconnect all government offices, a national backbone network that will allow for domestic and international flow of information, district connectivity to connect all 13 district capitals using the national backbone network, and an emergency communications network. The formulation of a National ICT Policy is also being planned.

The establishment of the Consultative Committee would have a positive impact on national ICT development in Timor-Leste. This multisectoral committee is to be given the task of monitoring and advising the regulatory agency on specific matters.

LEGAL AND REGULATORY ENVIRONMENT FOR ICT

Currently there are only two laws applicable to the telecommunications sector in Timor-Leste. Both were promulgated by the

president of Timor-Leste on 22 May 2003. The first (Decree Law No. 11/2003, ‘Establishing the Basis for the Telecommunications Sector’) establishes the basis for the telecommunications sector while the second (Decree Law No. 12/2003, ‘Establishing The Communications Regulatory Authority and Approving the Statutes Thereof’) mandates the establishment of the ARCOM.

Much of the de facto legal and regulatory framework for telecommunications is contained in the 15-year concession contract the Government of Timor-Leste signed with a consortium led by Portugal Telecom Internacional (PTI) in July 2002. Members of the consortium formed Timor Telecom in October 2002 and it has a monopoly over all services except for broadcasting infrastructure and the Internet service. UN agencies and foreign governments are allowed to install their own private networks, bypassing Timor Telecom for Internet bandwidth and other carrier services.

The ARCOM, with support from the International Telecommunications Union (ITU), is currently preparing telecommunications regulations for costing and pricing, universal service obligations (USO), number portability, carrier interconnection, numbering, service providers, and the Internet (cyber law), as well as frequency regulations and a new broadcast plan.

There is also a great need for laws and regulations to protect privacy and copyright and to fight cybercrime. In October 2007, one of the political parties presented a taped (by an unknown party) telephone conversation by high-ranking state officials during a National Parliament Plenary session that was accessible to the public. The incident prompted calls for laws and regulations to secure the privacy of Timor-Leste’s citizens and to establish secure communication lines within the sovereign institutions of Timor-Leste.

The lack of an integrated ICT development plan and policy makes the development process in this area uncoordinated. Government departments, divisions, or sections are left to apply their own rules and regulations with respect to ICT, as well as their own standards and specifications when it comes to procuring hardware and software.

DIGITAL CONTENT INITIATIVES

There are few websites that use the country’s two official languages, Portuguese and Tetum. Most of the existing websites target foreigners as their main users. This is understandable since the Internet penetration in Timor-Leste remains very low. The number of websites written in Tetum is particularly low. One of these, www.suaratimorlorosae.com, is owned by the Suara Timor Lorosae (STL) or Voice of Timor-Leste. This bilingual website

(it uses both Indonesian and Tetum) is the only online newspaper in Timor-Leste. However, most of the website’s contents are derived from the print version circulated in Timor-Leste.

Timor Post, the second biggest newspaper, has announced an online version (www.timorpost.com).

The United Nations Integrated Mission in Timor-Leste (UNMIT) website, www.unmit.org, also uses Tetum as one of its language options.

Most government websites are written in Portuguese and English, indicating a great interest on the part of government in informing the world about the progress the country is making. However, the information on these websites is inaccessible to Tetum-speaking Timorese.

Timor-Telecom has managed to register the country’s version of the Google search engine with the address www.google.tl. The search engine is in Portuguese, which means few people in Timor-Leste can actually use the search engine.

ONLINE SERVICES

e-Commerce

e-Commerce in Timor-Leste is practically nonexistent as the cost of Internet connections, registering a domain name, and maintaining a Web server is expensive. Another reason is that the electricity supply (even in Dili) is very unstable. Any organization or individual who is willing to maintain a Web server locally will almost certainly have to purchase a generator, which means even higher capital and operational costs.

There is also a lack of locally qualified Web designers and Web developers to develop and maintain highly dynamic and interactive e-commerce websites.

Another reason could be the fact that the three commercial banks in Timor-Leste — the Australia New Zealand Bank (ANZ), the Indonesian-owned Mandiri Bank and the Portuguese-owned Banco Nacional Ultramarino (BNU) — do not provide local credit-card facilities or online banking services. In fact, there are only six automatic teller machines (ATM) in Timor-Leste, all using Timor Telecom’s communication links.

e-Government

The Personnel Management Information System (PMIS), a project of the Government of Timor-Leste and the United Nations Development Programme (UNDP) Timor-Leste office, was launched in October 2007 to improve government human resource management and to provide a base for the elaboration of human resource policies. It will allow the government to formulate a variety of management indicators for the entire civil service.

Unfortunately, the objective is not likely to be met in the near future since there is currently no network connectivity between government offices and departments. Furthermore, government institutions are currently using different standards for software and hardware, which would make integration of their systems difficult to achieve.

The Department of Education, with the support of the United Nations Children Fund (UNICEF) Timor-Leste, has developed an Education Management Information System (EMIS) to manage a database of schools.

In October 2007, the Department of Justice, with support from UNDP's Justice Support Project, installed a VoIP system. All of the Department's servers have been migrated to the Linux Operating System.

ICT EDUCATION AND CAPACITY-BUILDING

Timor-Leste has a handful of tertiary institutions that are delivering courses in computer science, computer technology, information management, and information technology. These institutions are: DIT; East Timor Institute of Business (IOB); Timor-Leste National University (UNATIL) with support from the Fundação das Universidades Portuguesas (FUP) or the Foundation of Portuguese Universities; Dom Martinho University; the Instituto Profissional de Canossa or the Canossa Professional Institute owned by the Catholic Church; and Akademi Komputer (AKAKOM) or the East Timor Computer Academy. Almost all of these institutions are facing the same problems — a lack of qualified lecturers and lack of facilities (e.g. computer laboratories, textbooks, and Internet connection).

On the other hand, many government and privately owned institutions, as well as the Catholic Church and international NGOs, are involved in ICT training activities. General computer skills have become a key requirement to get a job in Timor-Leste.

OPEN SOURCE INITIATIVES

Although the community of open source users in Timor-Leste is small, use of the Linux version of Ubuntu is becoming a trend. The pioneers in using this Linux distribution are the Info Exchange East Timor (InfoTimor, <http://www.technology.tl/index.shtml>) and the Department of Justice, with support from a UNDP Project.

Info Timor, with support from Inforchange Australia and the state government of Victoria, Australia, is currently distributing

free personal computers (PCs) pre-installed with Linux Ubuntu Distro to NGOs, local governments at district and sub-districts levels, and educational institutions in Timor-Leste. InfoTimor is also training users of the freely distributed PCs in how to use Linux (Ubuntu) and the open source office productivity software OpenOffice. One hundred fifty PCs have been distributed and 55 staff members of non-profit organizations trained (InfoTimor 2008).

There is also a spell-checking tool for Tetum for the OpenOffice suite developed by Lev Lafayette, Peter Gossner, and Kevin Scannel (Lafayette 2005).

CHALLENGES AND OPPORTUNITIES

There are many barriers to the adoption of ICT in support of Timor-Leste's national development process. One of these is the perception, shared by many government officials, academics and others, that ICT is not a high priority for the country. The abolition of the Department of Transport and Telecommunication and its merger with other sectors under the Department of Infrastructure is an indication of the low priority given by the government to the development of the ICT sector.

Once the government recognizes the importance of ICT for the development of the country and gives higher priority to this sector, the most urgent task is to improve the regulatory environment. This will be a great challenge, as the concession contract giving Timor Telecom a monopoly does not expire until 2017 and the contract does not include any obligations for Timor Telecom to offer affordable pricing or to deploy services in rural areas beyond the district capitals. Unless these shortcomings are remedied soon, the government will not be able to effectively harness ICT as a tool for development.

On the infrastructure side, lack of electricity remains one of the major obstacles in promoting the use of ICT. According to a World Bank report (2007), only 43,500 households (approximately 22 percent of the total population) have access to electricity. Most of these households are in Dili: approximately 85 percent of households in Dili have access to electricity compared to only about 5 percent of households in the rural areas.

The high cost of telephone and Internet services and the very limited number of qualified IT professionals are also among the key challenges in the development of the ICT sector.

On the other hand, because the development of the ICT sector in Timor-Leste is still in the early stages, the country has the opportunity to choose to adopt systems that fit the country's conditions and make use of the latest technologies. For instance, the use of open source software is appropriate given the country's

lack of financial resources (Lafayette 2005). The use of wireless networking technology is a cost-effective solution for the mountainous terrain and the dispersed communities across the sparsely populated country. Wireless technologies in general would be easier to install and they require less maintenance than wire-line services. Moreover, with increasing deployment of wireless services globally and particularly in developing countries, the costs associated with this technology are decreasing.

NOTES

1. Violent clashes erupted from a crisis within the national army, the Timor-Leste Defense Force (Falintil-Forças Defesa de Timor-Leste or F-FDTL).
2. In July 2008 the parliament of East Timor approved a new taxation system that reduces the telecommunication services tax to 5 percent only. Timor Telecom responded to this by reducing its prices by 10 percent (Timor Telecom 2008).
3. East Timor is administratively divided into 13 districts and each district is further divided into several sub-districts.

BIBLIOGRAPHY

Autoridade Reguladora das Comunicações (ARCOM). (2006). *Statistics*. Retrieved 15 April 2008 from <http://www.arcom.tl>

Connect East Timor (CET). (2007). *CET Campaign Plan*. Retrieved 15 April 2008 from <http://connecteasttimor.com/content/?id=52>

Government of Timor-Leste. (2002). *National Development Plan*. Retrieved 1 November 2007 from <http://www.pm.gov.tp/ndp.htm>

———. (2007). *IV Constitutional Government Program 2007–2012*. Retrieved 20 November 2007 from <http://www.laohamutuk.org/misc/AMPGovt/GovtProgramEng.pdf>

InfoTimor. (2007). *About InfoTimor*. Retrieved 10 December 2008 from <http://www.technology.tl/about.shtml>

Lafayette, L. (2005). Wrestling the crocodile: Information technology development in Timor-Leste. *ANU Development Bulletin*, (68): 133–35. Retrieved 15 April 2008 from <http://devnet.anu.edu.au/db%2068-pdfs/31%20lafayette%2068.pdf>

Timor Telecom. (2007). *Statements*. Retrieved 15 December 2007 from http://www.timortelecom.tp/eng/index_uk.html

———. (2008). *Timor Telecom lowers prices. News (Timor Telecom reduz preços!)*. Retrieved 30 October 2008 from http://www.timortelecom.tp/eng/feliz_uk.html

United Nations Development Programme (UNDP). (2007). *Project fact sheet: Integrated system for a new management of East Timor's public administration*. Dili: UNDP.

———. (2008). Timor-Leste. *Human Development Report 2007/2008*. Retrieved 15 April 2008 from http://hdrstats.undp.org/countries/country_fact_sheets/cty_fs_TMP.html

World Bank. (2007). *Timor-Leste economic and social development brief*. Retrieved 29 October 2007 from <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/TIMORLESTEXTN/0,,0contentMDK:21468731~pagePK:1497618~piPK:217854~theSitePK:294022,00.html>