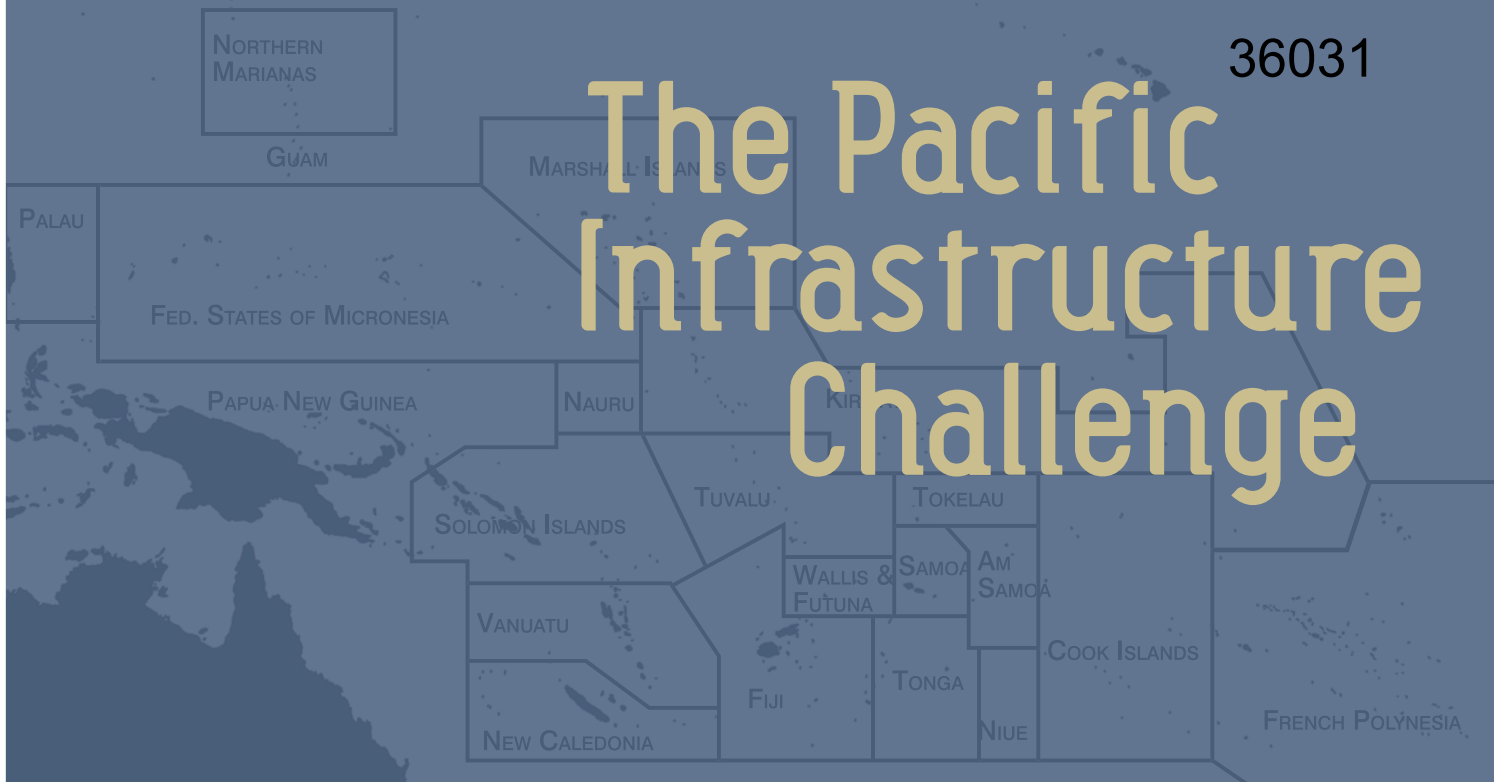


# The Pacific Infrastructure Challenge



A review of obstacles and opportunities for improving performance in the Pacific Islands



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January 2006



The World Bank

East Asia and Pacific Region

Pacific Islands Country Management Unit

This report originated as part of the Background Paper prepared for the joint IBRD/ JBIC/ ADB East Asia and the Pacific regional infrastructure study, Connecting East Asia. Many stakeholders expressed interest in understanding more about differences and similarities among Pacific Island countries, how Pacific Island countries compared to other island states in the world, the role infrastructure plays in growth and development in the Pacific Islands region, and in identifying opportunities and obstacles to improving infrastructure performance.

The World Bank asked Castalia Strategic Advisors to prepare this report.

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# 1 Acronyms and Abbreviations

ADB	Asian Development Bank
AFL	Airports Fiji Limited
ASPA	Association of South Pacific Airlines
ATH	Amalgamated Telecom Holdings Limited (Fiji)
AUD	Australian Dollars
AVL	Airports Vanuatu Limited
BOT	Build-Operate-Transfer
CAAFI	Civil Aviation Authority of Fiji Islands
CROP	Committee of Regional Organizations of the Pacific
CSI	United States Customs and Border Protection Container Security Initiative
DCA	Department of Civil Aviation (Vanuatu, Timor-Leste)
EC	European Community
ECTEL	Eastern Caribbean Telecommunications Authority
EEZ	Exclusive Economic Zone
EPC	Samoa Electric Power Corporation
FEA	Fiji Electricity Authority
FINTEL	Fiji International Telecommunications Limited
FSM	Federated States of Micronesia
GDP	Gross Domestic Product
GEF	Global Environment Facility
GoSI	Government of Solomon Islands
GSM	Global System for Mobile
IBNET	International Benchmarking Network
ICAO	International Civil Aviation Organization
ICT	Information and Communication Technologies
IFI	International Finance Institution
IMF	International Monetary Fund
IMO	International Marine Organization
IP	Internet Protocol
IPBC	Independent Public Business Corporation
IPP	Independent Power Producer
ISP	Internet Service Provider
ISPS	International Ship and Port Facility Security Code
ITU	International Telecommunications Union
JBIC	Japan Bank for International Cooperation
km	Kilometers
KPI	Key Performance Indicator
KSSL	Kiribati Shipping Services Limited

kWh	Kilowatt hours
MDG	Millennium Development Goals
MIAA	Marshall Islands Airport Authority
MIPA	Marshall Islands Ports Authority
MNOC	Multi-National Oil Company
MOTCA	Ministry of Transport and Civil Aviation (Fiji)
MOU	Memorandum of Understanding
MPAF	Marine and Ports Authority of Fiji
MPIF	Maritime Participation and Investigation Fund
MTCPW	Ministry of Transport, Communications and Public Works (Timor-Leste)
MWh	Megawatt hours
MWTI	Ministry of Works, Transport and Infrastructure (Samoa)
NRW	Non Revenue Water
NTC	National Telecommunications Commission
NZD	New Zealand Dollars
OBA	Output Based Aid
ODA	Official Development Aid
OECS	Organization of Eastern Caribbean States
OFWAT	Office of Water Services
OUR	Office of Utilities Regulation
PANGTEL	Papua New Guinea Radiocommunication and Telecommunication Technical Authority
PASO	Pacific Aviation Safety Office
PIASA	Pacific Island Air Services Agreement
PICTA	Pacific Islands Countries Trade Agreement
PIDP	Pacific Islands Development Program
PNG	Papua New Guinea
PNGWB	Papua New Guinea Water Board
PPA	Pacific Power Association
PPI	Private Participation in Infrastructure
PSP	Private Sector Participation
PTCL	Ports Terminal Corporation Limited (Fiji)
PTL	Ports Terminal Limited (Fiji)
PWA	Pacific Water Association
RPSO	Regional Private Sector Organization
RTA	Royal Tongan Airlines
SAA	Samoa Airport Authority
SAPHE	Sanitation, Public Health and Environment Improvement project
SOPAC	South Pacific Applied Geosciences Commission
SPA	Samoa Port Authority

SPREP	South Pacific Regional Environmental Program
ST	Solomon Telekom Company
TA	Technical Assistance
TCC	Tonga Communications Corporation
Telikom	Telikom PNG Ltd.
TEU	Twenty-Foot Equivalent Unit
TKSL	Telecom Services Kiribati
TSO	Telecommunication Service Obligation
TVL	Telecom Vanuatu Limited
UN	United Nations
UNDP	United Nations Development Program
UNELCO	Union Electrique du Vanuatu
US	United States
USD	United States Dollars
USP	University of the South Pacific
VAGST	Value Added Tax
VAS	Value-Added Services
WDI	World Development Indicators
WIAS	West Indies Associate States
WST	Western Samoa Tala

## 2 Executive Summary

This discussion document is aimed at encouraging debate about the role infrastructure plays in growth and development in Pacific countries. It identifies opportunities and obstacles to improved infrastructure performance.

We began by examining infrastructure performance in Pacific and comparator countries<sup>1</sup> on indicators for service coverage, quality, cost and economic viability. This allowed us to establish whether sector performance is relatively good or relatively poor in each country. We reviewed performance in the following infrastructure sectors: telecommunications, electricity, water and sanitation, roads, airports and aviation, and ports and shipping.

We observe that although some utilities perform well, and infrastructure access is adequate in some (mainly urban) areas, Pacific countries do not perform as well as comparator countries on most key performance indicators. In addition, levels of infrastructure access, quality and efficiency vary between countries of a similar size and income level within the Pacific region itself.

### 2.1 Why the Difference in Performance?

Pacific nations are relatively poor. While most Pacific countries enjoy relative macroeconomic stability, their fiscal situation tends to be weak, reflecting reliance on foreign aid. Clearly, poor economic performance makes it harder to achieve good infrastructure outcomes. However, the macroeconomic picture does not explain the Pacific infrastructure challenge. The real challenge is that Pacific countries demonstrate worse infrastructure performance than could be expected for their level of GDP.

An obvious possible explanation is that the costs of providing infrastructure services are naturally high in the Pacific. Small scale, dispersed populations, remoteness, and Pacific countries' susceptibility to natural disasters mean they don't benefit from the economies of scale infrastructure naturally offers, services are often more costly to produce and maintain, and it is expensive to increase access to rural areas.

However, we notice that in some Pacific countries infrastructure performance is worse than in comparator countries (such as Caribbean islands) with similar levels of income, and which share some 'disadvantages', such as small scale or vulnerability to natural disaster. Even within the Pacific region, some countries with greater inherent challenges demonstrate better performance in certain infrastructure sectors. This suggests that the inherent disadvantages of scale and topography alone cannot explain poor performance in infrastructure, and that some underperformance is due to poor institutional performance.

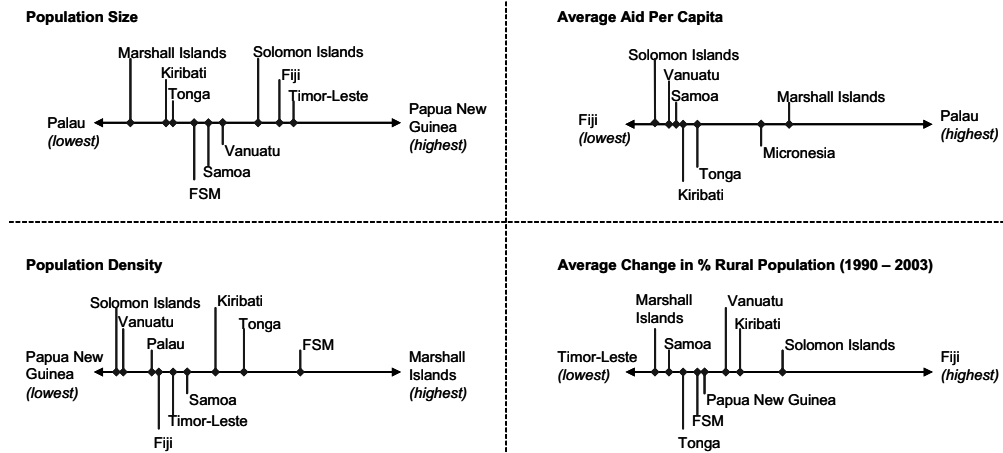
Poor institutional performance is generally likely to be the result of poor policy, but Pacific countries also share some characteristics that make it more difficult to build strong institutions. These include dependence on aid, small population size and low population density, ethnic diversity, low levels of rural to urban migration, small pools of skilled labor and youthful populations.

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<sup>1</sup> The Pacific countries reviewed were Fiji, Federated States of Micronesia (FSM), Kiribati, Marshall Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga and Vanuatu. Comparator countries included: Jamaica, St Lucia, St Kitts & Nevis, Grenada, Dominica, Barbados, Mauritius, New Zealand, and the Philippines

Pacific countries face each challenge to a different degree, as Figure 2.1 demonstrates. This means that the overall challenge differs from country to country. Because of this, it is difficult to group Pacific countries by type of challenge. Policies need to be modulated to respond to the specific needs of each country.

**Figure 2.1: Comparison of Defining Features**



Source: Castalia, based on World Development Indicator Data. Note: Not drawn exactly to scale

However, these challenges also do not completely explain infrastructure underperformance. Some Pacific countries that face greater challenges some areas, demonstrate better infrastructure performance than countries that are naturally more ‘advantaged’. For example, Vanuatu has a relatively dispersed population, high degree of ethnic diversity, and a moderately small population size and high dependence on aid, and yet it is one of the most efficient providers of water and electricity services in the region.

We conclude that better policies, institutions and management can help to improve the overall level of infrastructure performance in Pacific countries.

## 2.2 Barriers to Growth and Development in the Pacific

There are three principle infrastructure barriers to growth and poverty reduction in the Pacific:

- Low levels of access to infrastructure in rural areas
- Inefficient service provision
- Inappropriate infrastructure pricing.

The key institutional and policy failures which are responsible for these barriers are poor policy coordination and lack of accountability.

Good coordination involves all aspects of government policy pulling in the same direction to ensure effective and efficient provision of infrastructure services. Some examples of poor coordination in Pacific countries include:

- Infrastructure is complex, capital intensive and lasts a long time. It is therefore important to plan for the long term, when embarking on infrastructure projects. However, in the Pacific, governments have often focused on building new infrastructure, rather than investing in operations and maintenance. This has contributed to poor performance later on

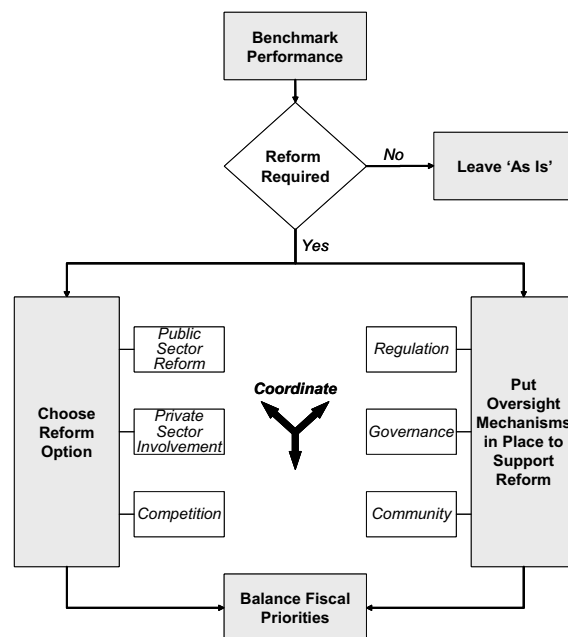
- Fiscal, regulatory and policy decisions are often not aligned, and are sometimes contradictory. For example, a corporatization strategy requires consistency between governance, tax treatment, accounting rules, corporate objectives and fiscal support for corporatized entities. Lack of coordination means that reforms intended to improve performance in the Pacific have often failed to achieve the desired results
- Although some Pacific countries develop infrastructure master plans, anecdotal evidence suggests implementation of infrastructure development, upgrades and maintenance often lack coordination between sectors. For example, it would make sense to try to coordinate maintenance or upgrades to water pipes and telecommunications lines, which are buried along the same stretches of road.

Pacific countries have few institutional arrangements or governance processes in place which traditionally encourage accountability. There is very little competition for services, and few effective oversight mechanisms in place to ensure monopoly providers operate efficiently and price effectively. In fact, in many Pacific countries, infrastructure services are provided and sanctioned by the same entity, the government. This model has failed to provide incentives for good performance.

### 2.3 Is it Possible to overcome these Barriers?

Appropriate infrastructure development will only be achieved and sustained in the long term with institutional arrangements and governance structures that offer incentives for good performance and provide for coordination. In the figure below, we propose a framework for infrastructure reform which attempts to address barriers to coordination and accountability:

- 1) Benchmark performance to identify if reforms are necessary, and if so, what sector-specific challenges must be overcome. Where performance is acceptable, no reform is needed
- 2) Select the appropriate mix of reforms. These may include public sector reforms, introducing private sector involvement, introducing competition, or a mixture of these solutions
- 3) Regardless of the reform option selected, governments need to put in place sufficient oversight mechanisms to encourage good performance and discourage poor performance
- 4) The government needs to give infrastructure development appropriate priority in budget allocation, both to ensure an efficient mix of investment and maintenance, and to provide subsidies which achieve the “biggest bang for the buck” in terms of infrastructure outcomes



- 5) All relevant policies, plans and implementation mechanisms must be fully coordinated to ensure results.

Some of these reforms have been tried before in Pacific countries, with mixed success.

*Regional benchmarking* has been initiated in the electricity and water sectors. These programs have faced some challenges. Many utilities lack the human resources capacity to undertake the required data gathering, and utilities do not adopt a common approach to measuring performance for each indicator, therefore comparisons are not always accurate. In addition, electricity benchmarking results are not made public. This has caused an added capacity burden for utilities, as consultants or donors must contact them directly for data each time a review is undertaken. Keeping the results confidential does not help to create the incentives for improved efficiency one could expect from such a program.

Most Pacific governments have initiated *public sector reforms* to address poor infrastructure sector performance. Corporatization has been successfully implemented for Papua New Guinea's Water Board, the Fiji Electricity Authority and the Samoa Ports Authority. However, it has been less successful in other cases. Many technical assistance programs have been implemented to strengthen public sector capacity to enable public sector reforms. These have also had mixed success.

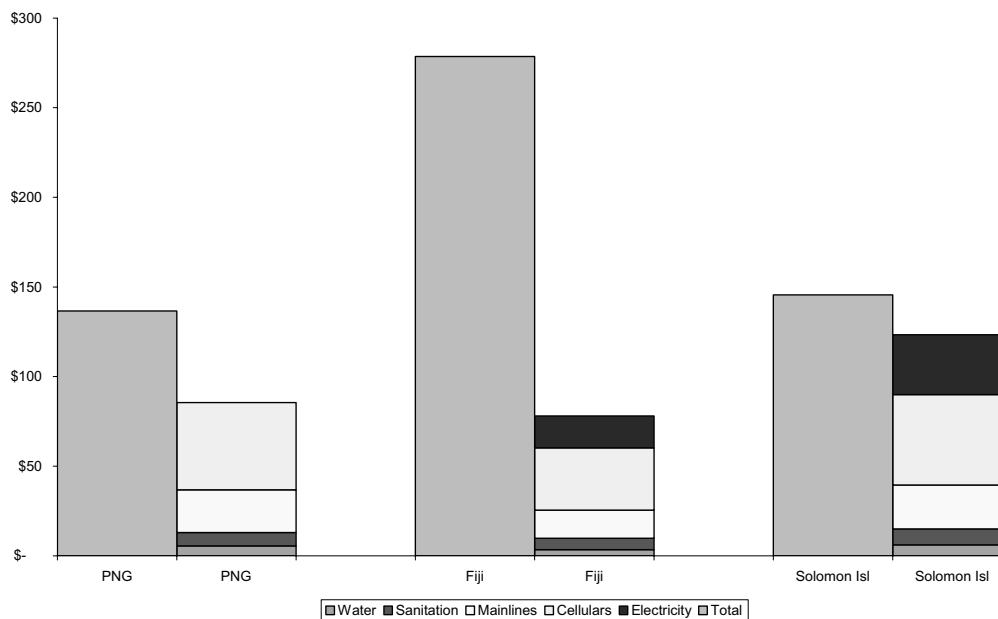
There are few examples of *private sector participation* in the Pacific but experience in comparator countries has shown it can help to improve performance. Fiji has had some success in outsourcing electricity generation, Vanuatu's decision to engage a private operator to deliver water and electricity services under a concession contract has resulted in some of the most efficient services in the region. Ports in Samoa have benefited from adopting a 'landlord' model, in which port services are provided by private companies. However, poorly planned PSP arrangements have resulted in additional challenges for infrastructure performance in the Pacific and elsewhere.

*Competition* is limited in the Pacific, but where it has been introduced, it has been effective in achieving performance improvements in certain sectors, despite small scale.

## **2.4 What's the Size of the Challenge?**

Improving access to and the quality of infrastructure in the Pacific will require considerable investment. We were unable to obtain comprehensive data with which to calculate investment needs for each infrastructure sector, in each Pacific country. However, Figure 2.2 provides a useful snapshot. It shows that if total investment levels were to be maintained at their current levels, a significant re-allocation of resources would be required. For example, Fiji, which has enjoyed relatively high levels of total investment due to its strong tourism and manufacturing sectors, would need to devote about 25 percent of those investments to the infrastructure sectors. At the other extreme, Solomon Islands would need to allocate almost their entire current investment spending to infrastructure.

**Figure 2.2: Estimated Annual Investment Requirements for Infrastructure Sectors compared to Total Investment in 2003**



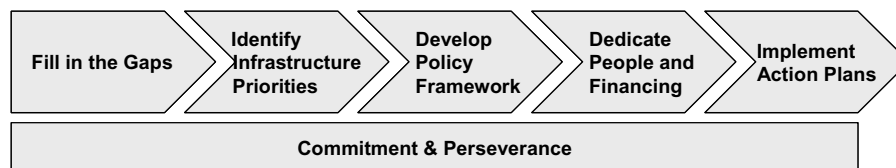
Source: *International Financial Statistics (IMF)*

Many Pacific countries have relied heavily on aid to fund major infrastructure projects in the past. Meeting future investment requirements will require a change to fiscal priorities, improved functioning of the financial sectors, and mobilizing domestic and international private savings.

## 2.5 How do we meet the Challenge?

There will not be a ‘one size fits all’ solution to infrastructure challenges in the Pacific. Figure 2.3 illustrates an approach to meeting the infrastructure challenge in the Pacific.

**Figure 2.3: An Approach to Meeting the Challenge**



Source: *Castalia*

The first step is to ‘fill in the gaps’, and to verify the data presented, and to test whether the analysis rings true for Pacific country leaders. Leaders and policy makers must then decide how big a priority infrastructure is for their country. They must also determine the infrastructure priorities, as not all sectors will require the same level of investment or focus.



Having identified the priorities, it will be necessary to put in place a policy framework that will enable and support the reform initiatives selected. People and finance must be dedicated to projects and program implementation. This process will take time. It will also take commitment and perseverance.

Based on our preliminary analysis, we propose a set of discussion topics for debate, to initiate the first step of 'filling in the gaps':

1. Will benchmarking help to provide a better picture of infrastructure performance?
2. What public sector reforms will benefit Pacific countries?
3. Can private sector involvement be encouraged?
4. How extensive are the opportunities for competition in the Pacific region?
5. How effective are the oversight mechanisms in the Pacific?
6. How can the public sector be strengthened to deal with barriers to good infrastructure performance?
7. How will the reforms and improvements be financed?

### 3 What's the Purpose of the Discussion Document?

This discussion document is aimed at encouraging debate about the role infrastructure plays in growth and development in Pacific countries, and the opportunities and obstacles to improved infrastructure performance. This debate will help to define a strategy for infrastructure development in the Pacific region.

We examine infrastructure performance in Fiji, Federated States of Micronesia (FSM), Kiribati, Marshall Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga and Vanuatu. We reviewed performance in telecommunications, electricity, water and sanitation, roads, airports and aviation, and ports and shipping.

The paper is structured as follows:

- First, we discuss the role infrastructure plays in economic growth and poverty reduction. We highlight the relationship between infrastructure and other development priorities in the Pacific (Section 4)
- Next, we consider how well Pacific countries are performing on key infrastructure indicators (Section 4). This section highlights the key findings from our infrastructure sector analysis in Appendix A
- In Section 6 we analyze why some Pacific and comparator countries perform better than others. Specifically, we question whether underperformance is influenced by countries' defining physical, political and cultural characteristics, and differentiate this from institutional failures that result from poor policy decisions
- In Section 6 we assess the reasons for poor policy decisions, and put forward a decision framework for infrastructure reform
- Section 8 presents our preliminary analysis on the amount of investment needed to overcome the infrastructure challenge
- Section 9 suggests a range of discussion topics for debate
- Appendix A contains infrastructure sector analysis for telecommunications, electricity, water and sanitation, roads, ports and maritime services and airports and aviation
- Appendix B summarizes the key infrastructure indicators and data used in the report
- Appendix C presents a selected bibliography.

## 4 Why is Infrastructure Important for Development?

There are many factors that contribute to economic growth and poverty reduction. Governments must balance investment in, and efforts to improve infrastructure performance with other priorities in health, education, environmental affairs, and commercial business development.

It is important to debate and establish a clear set of relative priorities for government policy in the Pacific. The purpose of this section is to consider the factors that may make infrastructure development the key priority for economic growth and overall social development. For example:

Box 4.1: What do we mean by 'Infrastructure'?

**This discussion document is concerned with 'economic infrastructure'. Economic infrastructure is the construction, operation and renovation of physical structures that provide a platform for most other economic activities. It includes telecommunications, electricity, water and waste water services; roads and public works programs, ports and airports, shipping and aviation services.**

- In addition to its obvious value for production activities, access to electricity provides a critical platform for health and education services. For example, electric lighting creates a better environment for study. Electricity is also essential for the refrigeration of medical supplies, enabling vaccination and other public health campaigns to be undertaken
- Access to clean water supply not only has an immediate health benefit, but also frees up the time and resources spent on coping with poor water resources for other productive activities. In many instances, women bear the brunt of coping costs, and improved access to water has the most immediate impact on women's development
- Mobility of goods and people plays an important role in social and economic development, promoting gains from trade as well as exchange of knowledge. Hence, roads, ports and other transport infrastructure make a key contribution to growth
- Transport and telecommunications infrastructure is a necessary element of effective governance in countries with thinly spread and isolated populations.

Economic studies<sup>2</sup> conducted for a wide range of developing countries indicate that well planned and managed infrastructure makes a strong contribution to productivity growth, and hence to growth in incomes. While no studies have been carried out specifically for the Pacific Island nations, there is no reason to believe that the outcomes would be any different.

Many Pacific country governments specifically acknowledge the importance of infrastructure in their development strategies and growth policies, as shown in Box 4.2, Box 4.3 and Box 4.4.

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<sup>2</sup> Relevant studies include: "Connecting East Asia: A New Framework for Infrastructure", ADB, JBIC, World Bank, March 2005; World Development Report 1994 "Infrastructure for Development", World Bank

Box 4.2: Improving Infrastructure for National Development in Fiji

In its 'Strategic Development Plan: 2003 – 2005'<sup>3</sup>, the Fijian Government describes the strategic priorities to be addressed in the medium term. This includes several infrastructure specific goals:

- *Universal access to internationally competitive information and technology services.* The strategy explains that improved telecommunications services can help to boost Fiji's employment, promote public and private sector efficiency, provide opportunities for rural development, and contribute to social development by enabling 'telehealth', 'distance education' and 'e-Government' services. Specifically, the strategy notes that "the high cost of these services is restraining future growth"
- *To provide an integrated transport system that is safe, efficient, affordable, accessible to all and environmentally sustainable.* Low levels of operations efficiency in road transport, ports, and outer island services are identified as constraints to growth in this sector. Policy objectives include ensuring adequate road maintenance and road cost recovery, improving shipping services and infrastructure to outer islands, promoting development of the aviation industry in support of tourism and expanding new industries relying on air freight
- *To facilitate the development of a resource efficient, cost effective and environmentally sustainable energy sector.* Policy objectives include ensuring that the demand for reliable, affordable electricity is met, increasing efficiency, accountability and cost effectiveness, and to promote energy conservation
- *Increase access to safe drinking water and a sanitary waste disposal system.* The Government identifies low levels of cost recovery, resulting from low tariffs and inefficient operations as the major constraint to improved services in this sector. Policy objectives include expanding the water supply scheme to rural areas and upgrading urban and regional water schemes to improve quality and efficiency.

Box 4.3: Key Development Areas for Kiribati

The Republic of Kiribati's National Development Strategy<sup>4</sup> highlights a number of infrastructure specific strategies to support development in six Key Development Areas.

Strategies for *Economic Growth* include:

- Upgrading air and sea port facilities and associated utilities at locations where natural and human resources can combine in viable economic activity
- Ensuring reliable power and water supplies in existing urban areas

Strategies for *Equitable Distribution* include:

- Devising a cost-effective maintenance methodology for outer island water supplies, roads and wharves
- Upgrading telecoms in all outer islands.

Although it is not explicitly stated, infrastructure can also enable strategies in other Key Development Areas. For example, the development goal '*Equipping People to Manage Change*' involves improving education and health services. Improved internet services can make it possible to upgrade teacher skills, or to strengthen nursing and public health training. Internet and computer access in turn depends on affordable, reliable electricity services.

<sup>3</sup> "Rebuilding Confidence for Stability and Growth for a Peaceful, Prosperous Fiji" Strategic Development Plan: 2003 – 2005, November 2002, Parliamentary Paper No. 72 of 2002

<sup>4</sup> "Enhancing Growth and Ensuring Equitable Distribution" Republic of Kiribati, National Development Strategies, 2004 - 2007

Box 4.4: National Objectives in the Solomon Islands

The Solomon Islands Government's national objectives are to<sup>5</sup>:

- Consolidate and sustain the Peace Process and the restoration of Law and Order to ensure the nation attains peace, unity and harmony
- Reconstruct the social and economic infrastructure, halt the current economic decline, stabilize and reverse it, thereby attain economic recovery
- Downsize the Public Service and shift resources towards private sector driven economic growth
- Service and settle the nation's debts within reasonable time and maintain greater financial sustainability and stability
- Foster a greater sense of National Unity and Identity
- Promote better distribution of the benefits of development and ensure a healthy, to literate and a contended population
- Achieve political stability and de-centralized decision making
- Generate job opportunities for Solomon Islands growing population
- Achieve higher economic growth, wealth and social well-being for all in Solomon Islands
- Advance Solomon Islands for its existence in the 21st century
- Ensure Solomon Islands is properly governed.

The Government outlined a number of priorities to ensure it meets these objectives. Infrastructure is one of these priorities. Existing infrastructure was either 'affected by the effects of the ethnic conflict, or in need of urgent maintenance' and the Government has indicated its commitment to rehabilitating infrastructure or building new infrastructure to 'halt the current economic decline, stabilize and finally reverse it to achieve economic recovery'. Infrastructure therefore goes hand in hand with constitutional, political and structural reform, and has a role to play in reconstruction and development.

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<sup>5</sup> Solomon Islands Government Programme of Action: Policies, Objectives, Strategies and Targets 2002 – 2005, Honiara, January 2002

## 5 How well are Pacific Countries Performing?

'Infrastructure Performance' describes how effectively infrastructure services are provided to consumers over the long term.

We measured infrastructure performance by comparing sector specific indicators of service coverage, quality, cost and economic viability for Pacific and comparator<sup>6</sup> countries. This allowed us to establish whether sector performance is relatively good or relatively poor in each country.

Detailed benchmarking by infrastructure sector is presented in Appendix A, based on publicly available data. Overall, we observe that although some utilities perform well, and infrastructure access is adequate in some (mainly urban) areas, Pacific countries do not perform as well as comparator countries on most key performance indicators. This section represents a summary of our observations.

### 5.1 Some Evidence of Good Performance

#### **Some service providers perform very well**

The Fiji Electricity Authority (FEA) became one of the best performing electricity utilities in the Pacific, following the appointment in 2001 of a Board with significant private business experience and a mandate to run the utility as a commercial entity. FEA has improved efficiency, reduced production costs and system losses, improved labor productivity, become financially self-sufficient, and introduced private sector participation in power generation.

Vanuatu's privately owned electricity and water operator, UNELCO, performs better than any of the other Pacific utilities we reviewed, on measures of quality and efficiency in water and electricity. The utility recovers all operating and capital costs, as well as the costs of loss-making rural electrification, through its tariff.

Apia Port in Samoa and Lae and Port Moresby in Papua New Guinea have some of the highest TEU throughput rates. They also have relatively low port charges. All of these ports are profitable.

#### **Teledensity has improved, and internet tariffs have dropped in some countries**

Tonga's mobile penetration levels have increased significantly since competition has been introduced. Within a year of introducing competition for mobile services, the tariff for almost all services dropped by more than 20% and the numbers of mobile subscribers and internet users both doubled. The result of competition has been that "telephones are easier to get, cheaper to buy and communication is faster". It has also resulted in the two competing companies upgrading their infrastructures for further use in communications and broadcasting.

In Papua New Guinea, competition between ISPs has reduced internet tariffs. In Samoa, the introduction of competing ISPs resulted in a price reduction of 50% in the incumbent ISP and an increase in internet traffic of over 100%<sup>7</sup>.

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<sup>6</sup> Comparator countries included: Jamaica, St Lucia, St Kitts & Nevis, Grenada, Dominica, Barbados, Mauritius, New Zealand, the Philippines,

<sup>7</sup> Castalia interview with Grant McGough, Acting CEO SamoaTel in September 2004

### **Infrastructure access is adequate in urban areas in some transport sectors**

Road density in urban centers is adequate for the population and traffic flows in most Pacific countries. However, access to rural and remote areas is inadequate in larger dispersed countries like Papua New Guinea and Vanuatu.

International and inter-island routes within the Pacific region are served by a mix of public and private operators. These routes are open to competition and services are considered to be adequate and efficient, with the exception of some outer island routes.

Air services are vital to Pacific countries and airport capacity plays an important role in accommodating tourist, business and cargo traffic. Larger Pacific airports such as the main airports in Fiji, Samoa and Papua New Guinea can accommodate long haul flights on B747s, while smaller airports such as Bonriki International in Kiribati can only accommodate the smaller B737 aircraft.

Although anecdotal evidence suggests that airport capacity is constrained at peak times, on major routes, capacity appears to be adequate at most airports given existing annual passenger and aircraft traffic.

## **5.2 More Evidence of Underperformance**

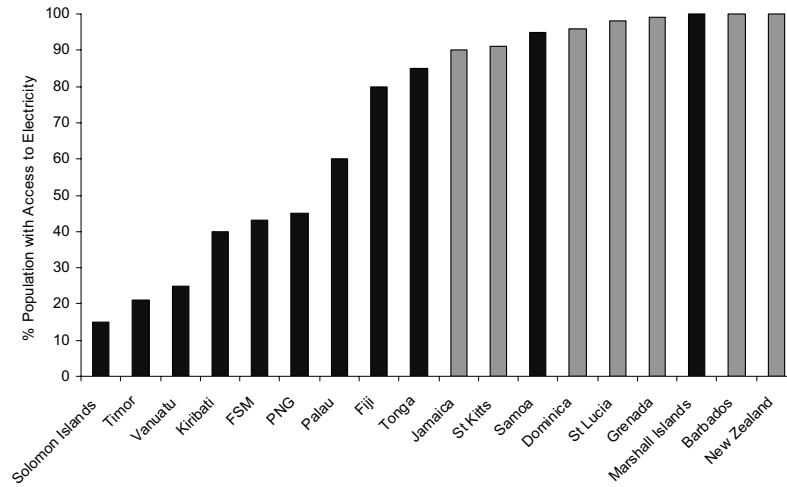
### **Access to network infrastructure is generally lower than in comparator countries**

Pacific countries generally have lower levels of access to telecommunications, electricity, and improved water and sanitation, than similar countries with the same level of income such as the Caribbean Islands or the Philippines (where a significant proportion of the population live on small islands).

In the telecommunications sector, in comparator countries, adoption of mobile phones has significantly increased access to telecommunications in recent years, especially in rural areas. Mobile telephony in Pacific countries has grown over the past few years, and is increasingly treated as a substitute for fixed line services, but growth in mobile uptake significantly lags most of the comparator countries. Telecommunications access in the Pacific is largely limited to urban areas.

Similarly, access to electricity in Pacific countries is relatively low, as Figure 5.1 shows.

**Figure 5.1: Access to Electricity**

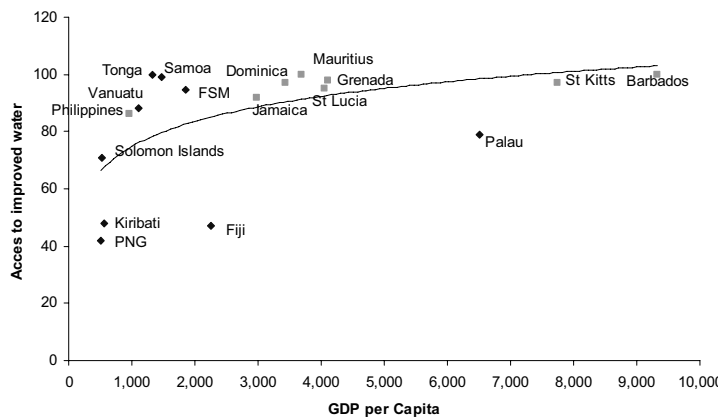


Source: Castalia Research, SOPAC

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Figure 5.1 demonstrates that of the Pacific countries reviewed only four provide access to improved water and sanitation services to 80% or more of the population.

**Figure 5.1: Access to Improved Water Supply vs. GDP per Capita**



Source: WDI Indicators

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Airport and port capacity is constrained. Low traffic volumes means Pacific ports are not congested. They nevertheless have lower throughput efficiency than comparator countries. This is partly due to the outdated equipment and design of these ports which are not built to handle container traffic.



None of the Pacific ports reviewed have container cranes. This increases ship turnaround time, and means that ships docking at these ports have to have their own lifting gear, limiting ports' ability to service international traffic.

Likewise, Pacific airports do not often suffer from overcrowding, but terminal facilities like retail, car rental and other services are lacking at most of the smaller airports. These services are important sources of non-aeronautical revenue for airports and help to finance maintenance and upgrades or expansion. They also provide a more positive experience for tourists and business passengers.

**Tariffs are relatively high in some countries**

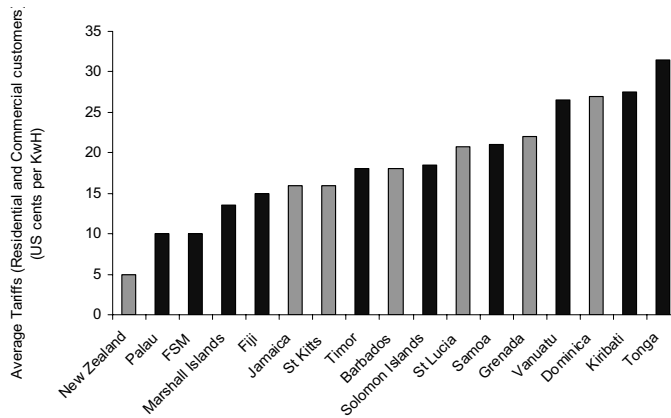
In all Pacific countries in this review, international telecommunications services are provided by monopolies. Charges for internet services and international calls from the Pacific are higher than in other small island countries, but local and mobile rates are similar.

The international trend in mobile and international telephony has been that tariffs have fallen significantly with the introduction of competition. This has been the case in most Caribbean countries. Tonga is the only Pacific country with competition in the mobile sector. It also has the lowest average mobile tariffs.

Average electricity tariffs are high in some Pacific countries, such as Tonga, Kiribati and Vanuatu as shown in Figure 5.2, but low in others. The lower tariffs in some countries can be partly explained by government subsidization. The lower tariffs in Fiji are partly explained by the fact that over 50% of electricity generation is hydro based.

While fuel costs and small size account for a good part of the high costs, there are other factors at work. For example, Tonga relies on the same fuel as Vanuatu, has about the same system size, and more favorable topography, and yet charges its customers considerably more.

**Figure 5.2: Residential Electricity Tariffs**



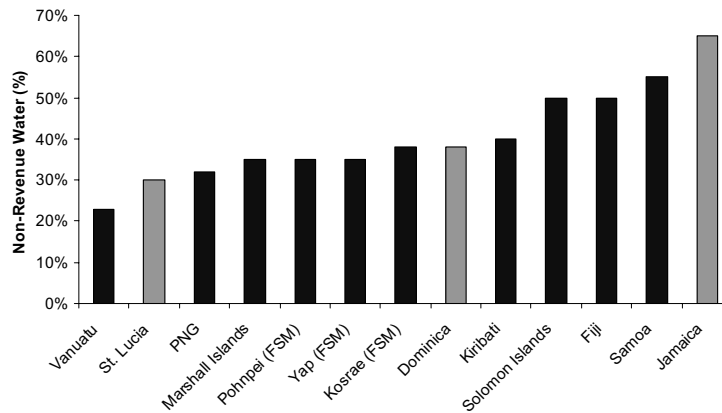
Source: Castalia Research, SOPAC. Notes: FSM: Federated States of Micronesia

### Water tariffs are often too low

In many Pacific countries water tariffs are held below cost. Vanuatu and Papua New Guinea are exceptions to the rule. In these countries, the higher tariffs reflect a requirement to recover reasonable costs and to generate a return on investment.

When tariffs are held below cost, operation efficiency and maintenance often suffer. Non-revenue water is an important measure of efficiency. While water utilities in many developing countries are able to achieve levels of between 20 and 30% non-revenue water, Figure 5.3 shows that in the Pacific only Vanuatu (Port Vila) has achieved this level of performance.

**Figure 5.3: Non-Revenue Water**



*Source: Castalia Interviews, Pacific Water Association 2001 Benchmarking Survey*

*Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia*

### There is room to improve efficiency and asset maintenance

In the water and electricity sectors, Pacific countries have lower labor productivity levels than most comparator countries. They also have high distribution system losses, increasing the cost of service.

In the past, government policies in Pacific countries have emphasized construction and extension of infrastructure over maintenance. As a result, road networks in many countries are in poor condition and some ports and airports have also been poorly maintained.

## 6 Why the Difference in Performance?

The preceding section showed that levels of infrastructure access, quality and efficiency vary between countries of a similar size and income level within the Pacific region itself, and relative to the comparator countries.

There are a number of possible reasons for the difference in performance. It is critically important to diagnose the problem correctly. It may be tempting to ascribe problems to the physical, social, and cultural features of the Pacific countries which are outside government control. However, an incorrect diagnosis would lead to poor policies.

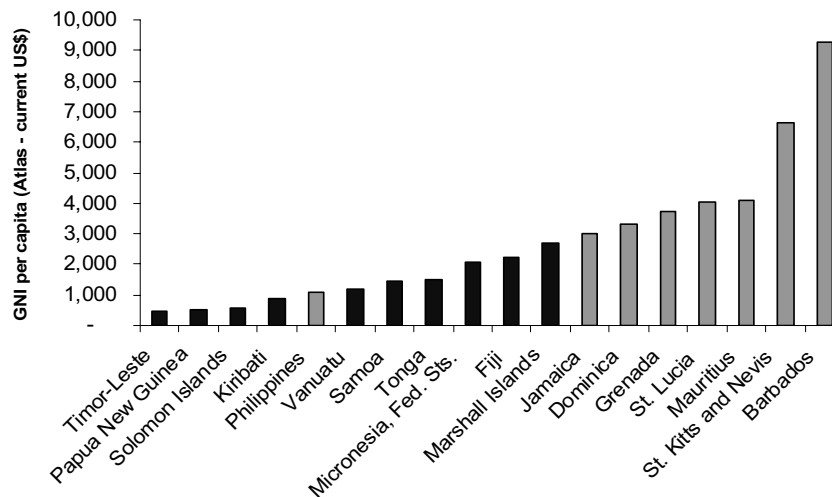
In this section we consider the different defining characteristics, such as population size, remoteness, or topography. Some of these characteristics make it more difficult to achieve good infrastructure performance, such as small scale, limited human resources or dependence on aid. We ask if these characteristics explain poor performance.

We then look at the institutional and management arrangements which influence infrastructure performance. Strong institutions can help small dispersed communities to improve performance despite any natural disadvantages. We ask to what extent weak institutions explain poor outcomes.

### 6.1 The Pacific Context

Pacific nations are relatively poor. Figure 6.1 shows that they have lower levels of income per capita than almost all comparator countries.

**Figure 6.1: GNI per Capita (Atlas Method)**



*Source: World Development Indicators 2003*

Table 6.1 shows that in addition to low levels, the rates of income growth have also been low. While most Pacific countries enjoy relative macroeconomic stability, their fiscal situation tends to be weak. This reflects these countries' reliance on foreign aid.

**Table 6.1: Summary of Selected Macro-Economic Indicators**

Country	GDP per capita growth (annual %)	Inflation (% annual change in CPI)	Cash surplus/ deficit (% of GDP)
Fiji	3.3	2.4	-9.5
Fed States of Micronesia	0.6	1.0	-6.7
Kiribati	0.7	2.3	-30.2
Marshall Islands	2.0	2.0	-3.1
Palau		3.4	-12.4
Papua New Guinea	0.4	7.4	-2.0
Samoa	2.5	2.4	-0.9
Solomon Islands	2.0	6.8	4.0
Timor Leste	-7.0	4.1	
Tonga	2.1	11.0	-0.6
Vanuatu	-0.2	2.8	0.9

*Source: World Development Indicators 2003*

Clearly, poor economic performance makes it harder to achieve good infrastructure outcomes. However, the macroeconomic picture does not explain the Pacific infrastructure challenge. The real challenge is that Pacific countries demonstrate worse infrastructure performance than could be expected for their level of GDP. This paper does not focus on why Pacific countries are poor. Rather, it examines why Pacific countries appear to under-perform in infrastructure service provision even for their relatively low level of income.

An obvious possible explanation is that the costs of providing infrastructure services are naturally high in the Pacific. This is due to a set of inherent characteristics shared by all Pacific countries:

- **Population size and density.** Very small populations constrain development. So do very dispersed populations. They make it difficult to achieve economies of scale in infrastructure service provision. For example, it costs about the same amount to install an electricity generator for a town with a population of 5,000 as in one with a population of 20,000. The difference is that the unit cost of service provision is higher in the smaller center. Providing a densely populated community with telecommunications or water costs less per person than extending these services out to remote dispersed communities.

Pacific countries share these challenges to varying degrees. Timor-Leste, Fiji and Papua New Guinea have relatively large populations, but they are very dispersed. Kiribati, Tonga and FSM have small, but relatively dense populations. Marshall Islands, although small, has the highest population density

- **Remoteness.** Most Pacific countries are a long way from major trading centers. Transporting fuel, building materials, machinery or parts is more costly for Pacific countries, raising the cost of service provision. Kiribati, Marshall Islands, FSM, Samoa and Tonga are all over 3,500 km from the nearest major port.

Vanuatu, Solomon Islands and Papua New Guinea are less remote, at distances comparable to some Caribbean countries' proximity to the US market. Palau is the least remote of the Pacific countries

- **Topography.** Topography also raises the cost of infrastructure service provision. Very high mountainous terrain makes it difficult and more costly to link infrastructure networks with hinterland communities. The Melanesian countries of Papua New Guinea, Solomon Islands, Vanuatu and Timor-Leste are all relatively mountainous.

No land elevation can be equally disadvantageous. Small low lying atolls have little topsoil, little groundwater and are vulnerable to rising sea levels, high tides and drought. Kiribati has a small freshwater lens which often is under threat in times of drought. Alternative water sources, such as desalination plants are expensive to install and maintain.

Countries comprised of numerous small, dispersed islands or atolls face the additional cost of linking services between islands. It is easier, and less costly to extend a telecommunications network to all communities on a single, flat landmass like Barbados, than it is to link the many islands of the Federated States of Micronesia, spread over a large Exclusive Economic Zone (EEZ). Table 6.2 shows that most Pacific countries share this disadvantage. They tend to be chains or archipelagos of more than 20 islands, while most comparator countries are less dispersed

- **Susceptibility to natural disaster.** Natural disasters such as cyclones, earthquakes or drought significantly increase the cost of infrastructure service provision. Damage from such events results in considerable loss of physical assets and in enormous economic costs. Samoa's average losses during disaster years amounted to almost half of their GDP for those years. In Vanuatu, it amounted to a third<sup>8</sup>. Hazard management procedures and equipment are a further expense, although they help to reduce the damage (and therefore the costs) from disasters.

In the Pacific, Papua New Guinea, Fiji and Tonga have experienced natural disasters most frequently – over 30 disasters in the past 55 years. Table 6.2 provides an overview of the potential for natural disaster in Pacific and comparator countries.

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<sup>8</sup> Regional Engagement Framework FY2006-2009 for Pacific Islands, May 3, 2005

These characteristics mean that Pacific countries get fewer benefits from the economies of scale infrastructure naturally offers, services are often more costly to produce and maintain, and it is expensive to increase access levels to rural areas.

So, does this explain why Pacific countries achieve poorer infrastructure outcomes than could be expected given their level of macroeconomic development? We do not believe it does. We notice that in some Pacific countries infrastructure performance is worse than in comparator countries (such as Caribbean islands) with similar levels of income, and which share some of these characteristics, such as small scale or vulnerability to natural disaster. Some Pacific countries that face greater inherent challenges to infrastructure provision, demonstrate better performance in certain sectors than countries that are equally or less 'disadvantaged'. For example, Samoa and Tonga have similar levels of income, are similarly remote, and Samoa has suffered significant damage from natural disasters, yet its electricity, roads, ports and airports sectors' overall performance is better than Tonga's.

This suggests that the inherent disadvantages of scale and topography alone cannot explain poor performance in infrastructure, and that some underperformance is due to poor policy, institutions or management.

Table 6.2: Topographical Features and Susceptibility to Natural Disasters

	Fiji	FSM	Kiribati	Marshall Islands	Palau	PNG	Samoa	Solomon Islands	Timor-Leste	Tonga	Vanuatu	Barbados	Dominica	Grenada	Jamaica	Mauritius	New Zealand	Philippines	St. Kitts & Nevis	St Lucia	
<b>TOPOGRAPHIC DISADVANTAGES</b>																					
- Mountainous terrain	Y	Y			Y	Y	Y	Y	Y		Y		Y	Y	Y	Y	Y	Y	Y	Y	
- Very low atolls/islands		Y	Y	Y	Y			Y													
- Number of islands > 20	Y	Y	Y	Y	Y	Y		Y		Y	Y							Y			
<b>POTENTIAL NATURAL DISASTERS</b>																					
- Cyclone/hurricane/typhoon	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
- Earthquakes/tsunamis						Y		Y	Y	Y	Y		Y		Y		Y	Y			
- Drought			Y	Y		Y		Y							Y						
- Flooding/Landslides						Y			Y						Y		Y	Y			
- Volcanic Activity	Y					Y				Y	Y						Y	Y		Y	
- Rising sea levels		Y	Y	Y																	

Source: EM-DAT: OFDA/CRED International Database for 1950 – 2004 data, UN System Wide Earthmatch Web Site: Island Directory (<http://islands.unep.ch>)

## **6.2 Challenges to Institutions and Management in the Pacific**

Poor institutional performance is generally likely to be the result of poor policy. However, it may also be a product of some inherent characteristics – additional institutional challenges which policy needs to overcome. In other words, Pacific island states may share some characteristics which create additional barriers for policy to overcome. In a sense, this would mean that Pacific Islands “have to run just to stand still” in order to achieve similar infrastructure outcomes to comparator countries.

Pacific countries share a number of features that make it more difficult to develop strong institutions and management. It is important to understand what these are, so that we can take them into account in commenting on infrastructure performance, and in developing recommendations for improved performance. These features include:

- The Pacific region’s dependence on aid
- Population size and density
- Ethnic diversity
- Political economy and security concerns
- Land rights
- Low rural to urban migration
- Small pool of skilled labor
- Youthful population
- The Pacific Diaspora.

We discuss each characteristic, its impact on institutions and management, and discuss the extent to which each Pacific country faces these challenges. Since different countries face these challenges to a different degree, understanding of these characteristics should allow us to modulate our discussion about how to improve infrastructure performance to the specific needs of each country.

### **6.2.1 The Pacific region’s dependence on aid**

Table 6.3 shows that Pacific countries received the highest per capita donor aid of any region in the world from 1970 to the turn of the 20<sup>th</sup> century. Per capita aid is over 6 times as great in the Pacific as in the Caribbean. In total, over \$49 billion of aid was disbursed into the region in the 30 years from 1970.



**Table 6.3: Aid Flows to the Pacific and Other Regions**

	<b>Total Aid Flows 1970 – 1999 (1998 US\$ m)</b>	<b>Average Annual Aid Flows per Capita 1995 - 1999 (1998 US\$ m)</b>
<b>Pacific</b>	<b>49,300</b>	<b>220</b>
Caribbean	45,100	34
Sub Saharan Africa	416,600	22
Middle East and North Africa	282,600	15
Latin America	111,700	10
Other South Asia	137,800	9
Other East Asia	152,600	8
India	85,000	2
China	41,200	2
<b>Total</b>	<b>\$1,321,900</b>	

*Source: Helen Hughes "Aid has Failed the Pacific" ACIS Study 2003*

Most of the aid to the Pacific is provided by bilateral donors. Each donor attaches specific conditions to the aid, which must then be worked into each country's overall infrastructure strategy. The conditions are often contradictory and influence development priorities. This weakens governments' ability to plan and prioritize for the 'big picture'.

For example, in some sectors (e.g. roads), different donors set up, fund, and build parts of the same infrastructure system and leave it to the government to try and coordinate the different donor activities. This does not always work very well, and often produces poor quality infrastructure investment.

In recent years, donors have focused on supporting the social infrastructure and services, rather than on economic or infrastructure enhancement. Little or no provision has been made for capital replacement, and consequently much of the infrastructure in Pacific countries is in a poor state of repair and is aging rapidly. Many assets can only be replaced or upgraded with new capital injections often through donor provision. In part this is because governments are not making adequate provision for full cost recovery through tariffs for infrastructure services, or insufficient subsidies are being allocated in annual government budgets because of insufficient fiscal provision and/or inadequate knowledge about the true long term sustainable cost of providing infrastructure services.

Aid dependence also weakens accountability and risk management. When an infrastructure asset is created with aid money, the normal disciplines of valuing the asset and providing for its replacement in the future can be avoided, unless there is a clear government policy framework to adopt the appropriate fiscal disciplines and regulatory policy frameworks required to achieve good outcomes. In the longer term, this is an unsustainable approach to infrastructure investment. Making capital free may have contributed to poor governance and poor management over time by removing the pressure to have to pay for valuable assets or provide for their eventual replacement in the absence of donor aid.

The question is whether donor provision of capital through aid is adequately coordinated *between* donors, and whether the policy framework for providing infrastructure capital to Pacific governments is – unintentionally – hindering good infrastructure outcomes for consumers and for development policies.

## **6.2.2 Demographic Issues in the Region**

### **Population Size and Density**

Small and dispersed populations make it more costly to provide infrastructure services.

Countries with very dispersed populations, such as Papua New Guinea, Solomon Islands or Vanuatu, may find it more difficult to coordinate policies and investment programs than more densely populated countries like Marshall Islands or some of the Caribbean countries. There are particular challenges in understanding and balancing the priorities of dispersed communities. The practical costs of communicating with the remote communities, and achieving the appropriate levels of information and representation can also be very high.

Dispersion also makes institutional accountability difficult. These countries have many small isolated villages, which are far removed from central government control or oversight. It is difficult for government officials to frequently visit these remote communities, if at all. They are therefore less likely to be accountable to government, and the authority of the village chief is likely to take precedence.

Very small populations also limit countries' institutional options. This creates a further challenge for accountability. For example, it is more difficult to introduce competition or private sector involvement in countries with small populations as there are fewer people available to undertake the necessary oversight functions. In infrastructure, institutional complexity does not diminish with smaller levels of output. This creates higher transaction costs for small populations.

Because infrastructure is complex and capital intensive, it is important to plan properly, to clearly assess the risks and balance the costs and benefits. Pacific countries with very small populations, such as the Micronesian countries, have limited resources with which to clearly analyze the risks of big (relative to the size of the country) infrastructure projects. Risk assessment and planning can be outsourced to foreign experts, but this raises the costs significantly, and if done with donor aid, can weaken institutional coordination and accountability further, as discussed in section 6.2.1 above.

### **Ethnic Diversity**

Pacific countries have very strong traditional social and political systems. Good institutional performance is difficult to achieve in countries with dispersed and disparate tribal and ethnic groups or multiple isolated groups each with own immediate self-interest and communication difficulties between them. In Melanesian countries, for example, where there is an extensive clan system, ethnic tensions have resulted in frequent changes of governments over the past few years, and have provided challenges to good governance. By comparison, Samoa's relative homogeneity is perceived to have contributed to its success. It has not had to contend with the multi-racial, multi-cultural and multi-lingual difficulties experienced in other Pacific countries. The hierarchical chiefly system with its village councils works seamlessly with church organizations and helps to provide a context of stability in which conflict or financial hardships can be resolved<sup>9</sup>.

All Pacific countries have formal governance structures and institutions, but they are often overlaid by a 'shadow' or informal governance system, which is based on ethnic clans or groups. Government decisions can often be overridden by chiefs, weakening coordination and accountability. Because this is unpredictable, it also presents a challenge for risk management.

Institutional accountability is more difficult to achieve in countries where indigenous groups are strong. This is aggravated by the small population sizes. Together, these

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<sup>9</sup> "Samoa on Track" Fiji Islands Business, August 2004

characteristics increase the level of familiarity between key stakeholders, making it difficult to achieve the necessary levels of separation between infrastructure providers, and oversight authorities.

Land ownership and communal assets are another feature of ethnic diversity. Over 90% of land in the Pacific is customary land<sup>10</sup>. Under customary ownership, there is seldom a well defined set of owners or a way to manage community land. In some countries, land disputes can be appealed outside the jurisdiction of customary authorities. This presents a significant challenge to mobilizing investment in Pacific countries and adds complexity to providing infrastructure services.

### **Political Economy and Security Concerns**

A number of Pacific countries have been beset by political instability and a poor security environment in recent years. This is particularly true in Melanesian countries, where ethnic tensions, land disputes and other social tensions have gradually eroded the quality of governance, resulting in a leadership crisis. Political conflict weakens institutions and management and creates an environment of mistrust. In addition, these countries must prioritize restoring law and order, rather than improving infrastructure performance.

### **Land Rights**

In many Pacific countries, the majority of land is customary land. It is either held jointly by all members and descendants of a particular community, or by a subgroup within this community (e.g. all male or all female members). Traditionally, land has a special significance for Pacific people but, in urban areas, there is now a conflict between these traditions, and the demands of increasing urban development.

Infrastructure requires secure, uncontested access to land. In some Pacific countries, land rights present a challenge to infrastructure development, where Governments have been unable to negotiate the use of land for public purposes with landowners.

For example: In Papua New Guinea<sup>11</sup>, over 95% of the land is under customary ownership. These lands can't be mortgaged or sold. The customary land tenure system has many different levels of decision-making, and different owners often have different ideas for the use of a particular piece of land. Because most of the land is not surveyed or registered, disputes often arise.

The Government has recognized the need to use customary land for development purposes. It developed the Land Mobilization Program in 1989 to secure land tenure for public purposes. However, progress under this program has been slow, and land tenure is often secured through private agreements between customary owners instead of through formal channels.

This adds a level of insecurity to infrastructure development and where disputes arise, may significantly increase the cost. Secure land ownership or lease rights are also critical to foreign investors in infrastructure. Uncertainty over land rights may make it more difficult for some Pacific countries to mobilize foreign investment.

### **Low Rural to Urban Migration**

Although many Pacific countries have experienced an increase in rural to urban migration in the past decade, Figure 5.2 shows that rural populations still account for a significant proportion of the population. On average, rural populations in the Pacific account for between 70 and 80% of the total population, compared with an average of around 50% in comparator countries. Marshall Islands, Fiji and Kiribati are the three notable exceptions.

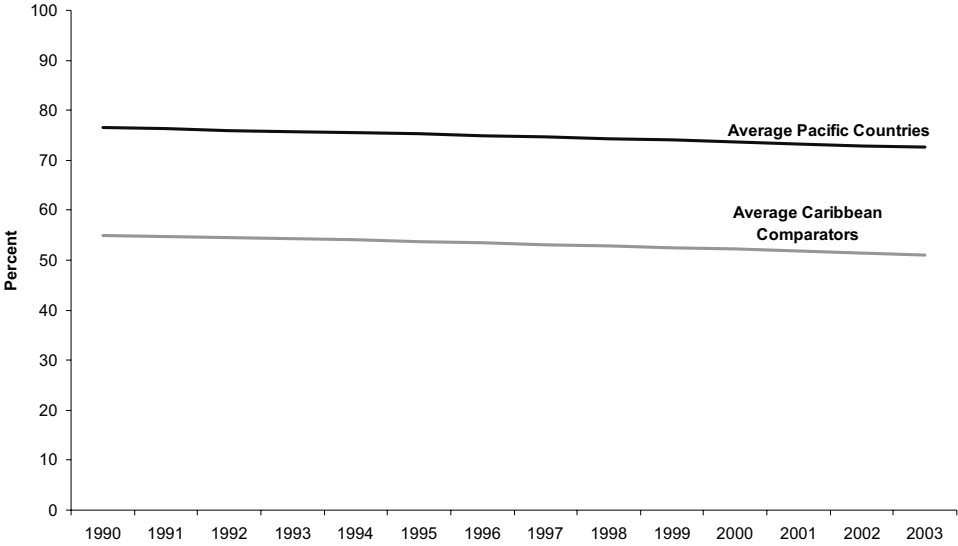
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<sup>10</sup> "Swimming Against the Tide" ADB

<sup>11</sup> "Managing the Transition from the Village to the City in the South Pacific"  
<http://www.unescap.org/huset/pacific/pacific2.htm>

These high rural populations mean that the spatial challenge for infrastructure in the Pacific is very different to that of most other developing countries. Elsewhere, particularly in East Asia, countries are grappling with rapidly growing cities, in which services like water and sanitation are critical. In countries with large rural populations, these concerns may be less pressing. For example, settled, largely self-sufficient rural communities may place relatively low value on water and sanitation services. Pacific countries' priorities for infrastructure are likely to be different to that of East Asian or other comparator countries.

**Figure 6.2: Rural Population (% Total Population)**



Source: World Development Indicators 1990 – 2003

Note: The average for the Pacific countries does not include the Marshall Islands, for which data were only available from 1999 – 2003. Marshall Islands reports 34% rural population for each of these years.

**Small Pool of Skilled Labor**

Strong institutions that work well require skilled people. The relatively few examples of successful infrastructure service provision in the Pacific are all distinguished by the presence of skilled managers and Board members. Performance improvements in the Fiji Electricity Authority, the Samoa Water Authority and the Samoa Port Authority are all due in part to the skills of the management teams.

Many Pacific countries have small populations, and therefore, a smaller pool of people to draw from to make infrastructure institutions successful. In addition, skilled individuals often leave to make their homes elsewhere, or are drawn abroad by companies in New Zealand or Australia that are prepared to pay the airfares for those prepared to join their workforce.

For example, Fulton Hogan, a road construction and maintenance company in New Zealand responded to labor shortages in New Zealand by almost stripping Samoa of skilled construction workers and bulldozer drivers under a scheme which gives Samoan citizens preferential access to New Zealand work permit. This further reduces the skills and capability in Pacific countries, directly deprives them of labor, and therefore impacts their ability to deliver good infrastructure services.

## Youthful Population

Approximately 40% of the population in most Pacific countries is under 15 years<sup>12</sup>. Pacific countries therefore have a comparatively small working force. This impacts the quality of infrastructure institutions, human resources capability and capacity.

This also affects the priority level Pacific governments may attribute to infrastructure. In countries with high youth populations, health or education may get a higher priority than some infrastructure sectors.

## The Pacific Diaspora: A Solution to Capacity Problems?

Like many areas of the world, the Pacific has suffered from large scale emigration from the region to larger countries. Emigrants have taken with them their skills and helped aggravate the problems of lack of scale many of these countries face.

The exact size of the Diaspora is difficult to gauge. Table 6.4 presents the numbers of people from three Pacific countries living in the major countries to which they have emigrated. These figures are influenced by the immigration policies of the recipient nations: for example, New Zealand has specific quotas for Samoans, and traditional preferences for allowing emigration from the Pacific to New Zealand. The pattern is not consistent: the Diaspora from Fiji looks to be relatively small, while from Samoa it is large, and relatively large from Tonga.

**Table 6.4: A Sample of the Diaspora from the Pacific**

Number of Pacific People Living Abroad ('000s)				
Country of Residence	Fiji	Samoa	Tonga	Total
United States	13.6	133.3	36.8	183.7
Australia	44.3	..	..	n.a.
New Zealand	7.0	115.0	40.7	162.7
TOTAL	64.9	248.3	77.5	
Total Population	835.0	178.0	102.0	
Diaspora as % of Total Population	7.7%	139.5%	76.0%	

*Source: Castalia, US Census 2000, Australian Census 2001, New Zealand Census 2001*

The effects of emigration are not all negative. The Diaspora provides a significant flow of income and capital for families left in the home countries, income which would not be generated within their local economies. However, how reliable these flows are in the long run is highly debatable, as the pressure to contribute a proportion of income in remittances 'back home' will dissipate as later generations may feel less bound to their families in the Pacific.

The question to consider for the future is whether the Diaspora offers realistic opportunities for rebuilding the human capacity shortages in the region, and what policies governments could adopt to attract emigrants home for short or long term purposes.

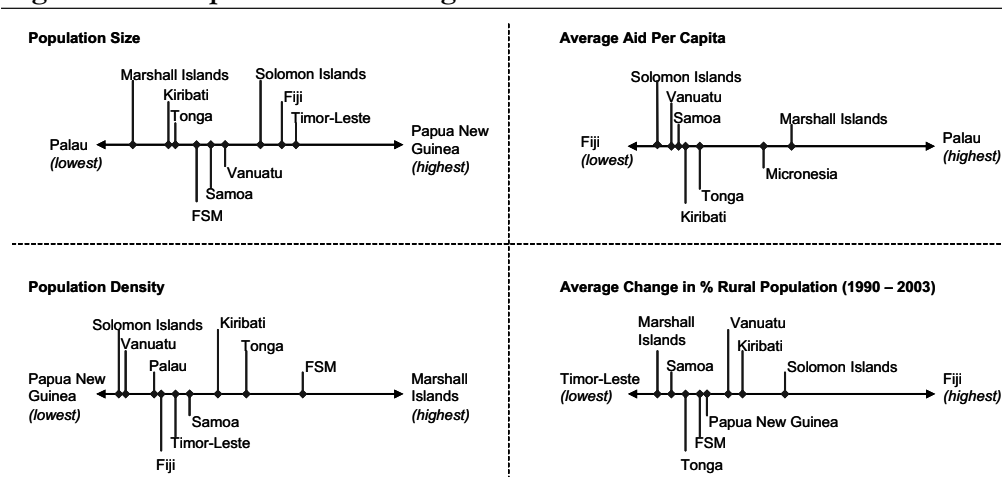
We leave this as a topic for consideration, as a possible policy response to helping overcome the scale and skills problems the Pacific countries face.

### 6.2.3 Impact on Infrastructure Performance

Figure 6.3 presents a comparison of some defining features in Pacific countries. It shows that each Pacific country has these characteristics to varying degrees.

<sup>12</sup> World Development Indicators 2003 data. By comparison, the average for the Caribbean comparators in this study was 29%

**Figure 6.3: Comparison of Defining Features**



Source: Castalia, based on World Development Indicator Data. Note: Not drawn exactly to scale

Pacific countries therefore face different challenges to good institutions and management, and hence require different practical responses to improve service provision. The challenge map in Figure 5.3 provides a useful basis for considering how policies need to be modulated to respond to different institutional challenges.

Some Pacific countries that face greater challenges in some areas, demonstrate better infrastructure performance than countries that are naturally more ‘advantaged’. For example, Vanuatu has a relatively dispersed population, high degree of ethnic diversity, and a moderately small population size and dependence on aid, and yet it is one of the most efficient providers of water and electricity services in the region. Compared with Fiji, Samoa has a relatively small population, which is predominantly rural, and is more dependent on aid, and yet its Port Authority is more profitable and better managed, it has greater road density, of which more are paved.

This suggests, that while these characteristics must be taken into account when developing Pacific solutions to infrastructure challenges, they do not completely explain underperformance. Better policies, institutions and management can help to improve the overall level of infrastructure performance in Pacific countries.

### 6.3 Policy Impediments to Development in the Pacific

The preceding section described the effects of Pacific countries’ inherent characteristics on infrastructure development. We have shown that poor infrastructure outcomes can not be explained solely by higher costs of infrastructure in the Pacific, but rather derive from poor institutional performance and poor policy formulation. Similarly, we have shown that while institutional problems are partly related to inherent the physical characteristics of the Pacific island societies and cultures, these features can not fully explain poor institutional performance. This section considers the key institutional failures which derive from bad decisions, and which can therefore be readily addressed.

We draw on the summary of performance in Section 5, and the sector analysis in Appendix A to describe the key infrastructure policy failures that are often caused by poor infrastructure policies, rather than by any inherent characteristics associated with geographic or human capacity features of the Pacific.

## 6.4 Low Levels of Access to Infrastructure in Rural Areas

Most Pacific countries have large rural populations. They are also highly dependent on natural resources for their economic development, most of which are sourced from rural areas. Therefore rural infrastructure is particularly important in the Pacific, and yet overall access to infrastructure services is very low in these areas. For example:

- Telephone access is largely limited to urban areas in the Pacific. In Kiribati, Marshall Islands and Papua New Guinea, between 85% and 100% of main lines are in urban areas. In FSM and Samoa urban mainlines account for 70% and 72% respectively. This can be explained in part by the challenge of deploying a telecommunications network across mountainous terrain or dispersed atolls. Low mainline access limits the level of internet access outside of main urban centers in the Pacific. Almost all internet users are located in capital cities
- Access to water and sanitation services varies substantially between urban and rural areas within each Pacific country, with rural access levels being lower. Many water utilities report higher levels of access in their coverage areas, which are often major urban centers, than is reflected in the overall access statistics. This highlights the lower levels of access in rural areas
- The larger Melanesian countries such as Papua New Guinea, Solomon Islands and Vanuatu have particularly low road density levels per square kilometer of land, and road access is often limited to lower lying coastal areas and major cities or towns. In Vanuatu a significant number of people live in the interior of Efate Island and Espiritu Santo Island but have no road access from their settlements to the coastal road
- In countries comprised of dispersed archipelagos or island chains, shipping and aviation services to outer islands are relatively infrequent.

Low access to certain infrastructure services may be in part due to sensible prioritizing. Reticulated water systems are not necessarily a high priority in rural communities in Vanuatu, Papua New Guinea or Fiji for example, where there is adequate rainfall, and wells or water tanks may suffice. However, other infrastructure services are essential to rural development. Electrification, roading, and in some cases, shipping and air services, are likely to be particularly important for economic development.

Clearly, high costs of serving thinly populated and dispersed rural areas will affect the ability of Pacific countries to provide access to infrastructure in rural areas. However, low access levels are also related to:

- Low priority being given to rural infrastructure, for example, when coordinating aid projects
- Inefficient subsidy arrangements, which mean that fiscal expenditures do not leverage as much infrastructure development as they possibly could. For example, supporting telecommunications access in remote areas through a cross subsidy built into the tariff structure means that even those customers who would be able and willing to pay the full cost of service, receive a subsidy
- Monopolies being granted to exploit profitable infrastructure opportunities. For example, policies preventing competition in domestic air services in Tonga have resulted in lower frequency and higher costs of air services than would have otherwise occurred

- Lack of legal and regulatory support for alternative modes of service provision. For example, in the Solomon Islands, telecommunications services are provided under an exclusive license which does not specifically set rural coverage targets (see Box 7.7). As a result, telecommunications access is largely limited to the Honiara area.

#### **6.4.1 Inefficient Infrastructure Service Provision**

The naturally higher costs of providing infrastructure services in the Pacific also mean it is particularly important to be as efficient as possible. However, many utilities and other infrastructure service providers in the Pacific demonstrate significant levels of inefficiency.

In the water and electricity sectors, Pacific countries have lower labor productivity levels than most comparator countries. With the exception of Vanuatu, Palau and Fiji, Pacific water utilities all have over 10 staff per 100 connections. By comparison, many water companies around the world are able to operate effectively on less than four staff per 100 connections. Pacific electricity utility labor productivity levels are also poor when compared with comparator utilities of similar size and level of performance.

Non-revenue water levels are high in Pacific countries. Many water utilities in developing countries are able to achieve levels of between 20 – 30% non revenue water. Of the Pacific countries, Vanuatu performs best with losses of less than 25%. Samoa, Fiji, Solomon Islands and Kiribati perform worst with estimated losses of between 40% and 55%. Pacific countries also have high distribution system losses, with many countries' losses at levels of 15% or more. FSM, Tonga and Samoa's losses are above 17.5%.

Inefficiency is a bottleneck in other infrastructure sectors as well. Pacific ports have lower TEU throughputs per annum than comparators. Operational efficiency is constrained by outdated design and equipment, and this inefficiency is compounded by poor maintenance.

#### **6.4.2 Inappropriate Infrastructure Pricing**

Given high costs, high prices for infrastructure services may be appropriate in some Pacific countries. Small scale and remoteness contribute to higher infrastructure costs. These translate into higher prices for customers. However, higher infrastructure costs (and therefore prices), can also be caused by inefficient operations. Some infrastructure prices in some Pacific countries are higher than could be expected, even given the challenge of small scale and remoteness.

Charges for mobile, internet services and international telephone calls are higher in Pacific than in most comparator countries, including the Caribbean which faces similar disadvantages of scale. Internationally, the trend in mobile and international telecommunications has been for prices to fall significantly with the introduction of competition. This has been the case in the Caribbean. Tonga experienced a similar decrease in prices for mobile calls after introducing a competing operator. This could be a result of inappropriate pricing prior to introducing competition. Alternatively competition may have spurred the mobile companies to operate more efficiently, reducing costs, and therefore pricing. This example suggests that competition could put downward pressure on prices elsewhere in the Pacific too.

Average electricity tariffs are high in some Pacific countries such as Tonga, Kiribati and Vanuatu. While fuel costs and small size account for a good part of these higher costs, there appear to be other factors involved. For example, Tonga relies on the same fuel as Vanuatu, has a similar system size and a more favorable topography, and yet charges its customers considerably more.



In other infrastructure sectors, prices are too low, and don't cover the cost of providing service. For example, water tariffs are held below cost in many Pacific countries, and have remained unchanged for many years. Fiji, the Solomon Islands and Kiribati have relatively low cost recovery ratios when compared with UNELCO, the water service provided in Vanuatu, which is allowed to recover the full cost of its operations, or the Papua New Guinea Water Board which managed to achieve a total cost recovery ratio of over 100%, including full operating expenses and depreciation.

When tariffs are held below cost, operational efficiency and maintenance often suffer. It is perhaps not surprising that Vanuatu and PNG's water utilities also have the lowest levels of NRW.

Pricing too high impedes development by making it more costly to live in and do business in Pacific countries. Pricing too low is also obstructive. This simply masks the actual costs of service provision, and creates a disincentive for good planning, investment and maintenance. Pacific countries demonstrate both of these problems in infrastructure.

## 7 Challenge: How do we Lift Performance?

Some Pacific and small comparator countries demonstrate better performance than others, despite facing similar challenges. So what goes wrong, and how do we change this?

To answer this question we must first try to determine what causes the infrastructure policy failures described in section 6.3. Then we can discuss possible ways to improve it.

### 7.1 What Causes Poor Infrastructure Policies?

#### 7.1.1 An Analytic Framework

The East Asia and Pacific Flagship Study<sup>13</sup> articulated a new framework for analyzing and responding to infrastructure challenges in this region. The study considers the key issues affecting infrastructure development under three headings: Coordination, Accountability and Risk Management.

Infrastructure is complex, capital intensive and lasts a long time. *Coordination* is necessary for good infrastructure performance. Coordination, in essence, is each country's ability to generate a strategic vision for infrastructure development and ensure the vision becomes a reality.

Good coordination prioritizes infrastructure development, balancing multiple objectives to ensure that the right infrastructure is provided to the right sectors of the community, at the right time. For example, the Government of Kiribati's National Development Strategies (2004 – 2007) outlined a number of strategies for economic growth, including tourism. The strategy notes growing the tourism sector will require both private investment and supporting infrastructure. To do this, the government needs to decide what levels of infrastructure must be developed to encourage tourists, and what can wait until the tourists, and hence the demand, is there. The ability to coordinate the priorities of different stakeholders and various government agencies with relevant responsibilities is critical to successful infrastructure development.

As a reaction to failed experience with central planning in the 1970s and 1980s, the 1990s saw a move from centralized approaches to greater reliance on market incentives and decentralized decisions. However, the key lesson from the 1990s is that decentralized provision of infrastructure requires as much, if not more, central coordination than the old model. The renewed emphasis on coordination is based on the recognition that the difficulties experienced by many countries in meeting the challenge of infrastructure development comes from an inability to put together a comprehensive set of policies which pull in the same direction. A critical example of this is the inability to create the fiscal space for the necessary public support for infrastructure. For example, many countries in the Pacific have struggled to allocate sufficient resources for the maintenance of the infrastructure built under aid projects.

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<sup>13</sup> “*Connecting East Asia: A New Framework for Infrastructure*” was launched by the Asian Development Bank, the Japan Bank for International Cooperation and the World Bank in Tokyo in March 2005

Box 7.1: The Impact of Good Coordination on Infrastructure

The East Asia Pacific Flagship Study highlights examples of where coordination has helped to achieve improved infrastructure performance in six East Asian economies: Hong Kong, Korea, Japan, Taiwan, Malaysia and Singapore.

Key features of coordination in these countries include:

- Political leaders and senior policy makers created a long term development vision, and sector strategies that flowed from this vision. There was a broad consensus between policy makers
- These economies emphasized infrastructure strategies that focused on achieving export-led growth, high savings and investment levels, and balanced social development
- In general infrastructure reacted to development constraints when they emerged, rather than anticipating demand. These reactions were rapid and strategic, and sector strategies adapted as production strategies changed
- Strong planning agencies drove infrastructure development at a central or sector level. These agencies had significant political influence
- Infrastructure service delivery was mainly carried out by a monopoly corporation, often publicly owned. A strong planning agency provided clear incentives for improved performance. Cost recovery policies were encouraged and operational subsidies were limited.

In each of these countries infrastructure performance improved substantially between 1950 and 1990, until financial crisis and economic slowdown began to impede development.

*Source: Connecting East Asia: A New Framework for Infrastructure, ADB, JBIC, World Bank, March 2005*

Successful infrastructure development also requires institutions and systems that reward good performance and punish poor performance. This will ensure all stakeholders remain focused on the 'big picture', and contribute to development, rather than seek to maximize their own short term gains. This comes under the general heading of *Accountability*.

There are various institutions that provide accountability, by encouraging oversight of infrastructure development, service provision and maintenance. These include competition, regulation or other oversight functions, such as monitoring service contracts. In most Pacific countries, community leaders also play an important oversight role. For example, in Samoa, the village chief or the church leader is consulted before a telecommunications company can decide to expand service into their village. In Kiribati and other Micronesian countries, village chiefs on small remote islands exercise a form of regulation by overseeing the operation of electricity generators.

*Risk Management* is closely related to accountability. In essence, this element of the framework focuses our attention on the need to ensure that the risks and rewards in the provision of infrastructure services are aligned.

The key conclusion of the Flagship Study is that improvements in coordination and accountability are the key elements in ensuring that infrastructure projects and policies contribute to the overarching goal of development. We have applied this framework to analyze the reasons for underperformance in infrastructure in the Pacific.

We suggest that there are two principle causes of poor infrastructure outcomes in the Pacific:

- Poor policy design and coordination, and
- Lack of good governance and accountability.

### 7.1.2 Poor Policy Design and Coordination

Infrastructure service provision is complex. Many organizations with conflicting objectives must be brought together to pull in the same direction. This is particularly true of government agencies and elected Cabinets which often operate as decision making “silos”, rather than as policy “integrators”. Difficult decisions have to be made and implemented across many institutions, but they often suffer from fractionation and inconsistency of policy decision making at the political or senior official level.

It is also important to have consistent and predictable government policies for infrastructure providers and operators. Creating a predictable policy environment for the private sector, or for state owned enterprises operating in a commercial manner where they face competition and/or statutory or regulatory requirements, is a key prerequisite of obtaining sustainable investment in infrastructure.

In this section, we discuss several common coordination problems in infrastructure in the Pacific.

1) *Lack of focus on creating sustainable investment in infrastructure:* In the Pacific, governments have often focused on building new infrastructure, rather than investing in sustainable infrastructure operations and maintenance. For example, Pacific governments have emphasized construction and extension of road networks to the detriment of operations and maintenance. This has contributed towards higher overall costs. The same is true of ports and airports.

2) *Lack of alignment of policy objectives and coordination:* Fiscal, regulatory and policy decisions are often not aligned and are sometimes contradictory. This can create problems. For example, a number of Pacific countries have embarked on a policy of corporatization, under which utilities should be paying a dividend to the government to reflect a reasonable return on the capital invested. Nevertheless, in some countries, tariffs are held below true long term operating cost and the dividend payment is waived as a way of meeting the revenue shortfall from consumers. This amounts to an indirect, non-explicit subsidy on services, often without a full understanding of the sustainability ramifications on the underlying infrastructural asset.

Instead of being clear about whether to provide a subsidy which is balanced against competing fiscal priorities and then appropriating it in the budget, there is often fudging of the long term sustainability of infrastructure provision. Often institutional structures are put in place to try and deal with the effects of the lack of clear policy objectives. This can result in the true costs of providing infrastructure being hidden, and with this, the true subsidies payable by taxpayers or classes of user are hidden from policy makers and consumers. They are often very large.

The Samoa Electric Power Corporation (EPC) provides an example<sup>14</sup>. The EPC has been corporatized for some time. As such, it is required by law to identify any community service obligations transparently. The company is also required by law to file Value Added Tax (VAGST) returns. There are no exceptions for large companies or government corporations. The EPC has paid around 5 – 6 million Tala in GST over the past 4 years, but has not passed this on to the consumer. There has been no tariff increase subsequent to the introduction of VAGST. Although the law states EPC can claim the VAGST it pays back, it has not yet done so and neither has it filed the required tax returns. It is implied that these claims are partly offset by the fact that EPC does not pay Government any dividend. Lack of transparent tax treatment makes it very difficult to establish whether EPC is receiving a subsidy, or is being stripped by the Government. As a commercial entity, EPC should have charged GST on electricity outputs (which would result in higher electricity tariffs), and claimed back GST on inputs. It should also have been held liable for failing to

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<sup>14</sup> Castalia Interview with EPC

file tax returns. A corporatization strategy requires consistency between governance, tax treatment, accounting rules, corporate objectives and fiscal support for corporatized entities. Lack of coordination means that reforms intended to improve performance fail to achieve the desired results.

A similar failure of policy coordination occurs when a country adopts a model of sector reform, but does not put in place the necessary conditions to make it effective. Fiji has adopted the 'Landlord' model for port operations, but contracts stevedoring operations out to a monopoly, government owned operator. This does not help to bring about the lower costs and improved efficiency expected from this reform.

3) *Inconsistencies between different aspects of sector policy*: It is important to have consistent regulatory, competition, universal access and investment policies so that providers of infrastructure services – whether they are in the private or public sectors – have a clear and transparent business environment to work within.

The expansion of rural electricity services in Vanuatu illustrates the problems which can occur where a consistent policy framework is not in place. Electricity services in the two main centers in Vanuatu are provided by UNELCO, a private firm. Government decided to expand service by inviting private providers to bid to serve two specified rural areas. The intention in holding a tender was to select the operator which could provide services at the lowest tariff. However, the way UNELCO was allowed to interpret the regulatory rules in its existing concessions meant that it could cross-subsidize the new rural concessions from its urban services. There was no way for other firms to do this. UNELCO won the bid in part because of this ability to cross-subsidize.

In a country with low capacity like Vanuatu, when an operator is working well, it *may* be smart to extend service by agreement with that operator, and to fund it through cross-subsidies. This would be a reasonable and coherent policy position. But what does not make sense is to implement a rural service policy based on competition, while having a regulatory policy which ensures that the competition does not take place on a level playing field. The service providers deserve to know what the rules are, and they should be consistent between all players. If they are not, then a government may find it difficult to attract investment in future. Allowing the perception to form in the minds of infrastructure operators that the policy framework is arbitrary or skewed in favor of the incumbent, is a sure and certain way to drive away the private sector, and fungible capital sources.

4) *Lack of coordination in development strategies across sectors*: It is equally important to coordinate infrastructure development or expansion between sectors. Although some Pacific countries develop infrastructure master plans, our observation from visits to Fiji, Samoa and Kiribati was that the implementation of infrastructure development, upgrades and maintenance is often uncoordinated<sup>15</sup>. For example, it would make sense to try to coordinate maintenance or upgrades to water pipes and telecommunications lines, which are buried along the same stretches of road. This could also be coordinated with road works. This would optimize the labor and time spent digging up the same area several times in succession.

Some countries outsource activities in more than one sector to private operators. In Fiji road maintenance and operation is performed by private operators, outer islands shipping services are operated under competitively tendered contracts, and the private sector also undertakes independent power production on a contract basis. In Samoa a number of port services, like stevedoring, are performed by private operators as is road construction and maintenance. Although these activities are very

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<sup>15</sup> In the Pacific countries visited, Ministry personnel, utilities and private individuals all commented that capital works projects and general maintenance was uncoordinated and requires more focus.

different, some efficiency may be gained from coordinating tender preparation, selection and contract monitoring activities across the sectors.

Outer islands development is another area that would benefit from infrastructure coordination. Most Pacific countries have prioritized increasing infrastructure access to outer islands, but utilities in each sector have individual universal access targets and none of the utilities interviewed reported planning, prioritizing or implementing expanded access to their services in conjunction with other utilities. It would also be sensible to coordinate extending transport, electricity and water with plans for outer island tourism, health or education development

*5) Ineffective coordination between public and private sector roles and responsibilities:* The private sector needs to know what role the country's government wants it to play. The policy framework and the processes which flow from that framework need to be transparent to allow it to respond properly. Lack of coordination in Pacific countries reduces the effectiveness of private participation in infrastructure, if for no other reason than private providers face considerable uncertainty. The implications of an uncertain government policy framework are considerable. For example: the risk premium built into pricing will be higher to cover the costs of getting things wrong; there is likely to be more expensive litigation as providers try to get certainty through the Courts (and this can be a problem in itself where the court system in a country is weak); and considerable management time can be wasted on arguing with officials or politicians about the meaning of an opaque government policy rather than concentrating on improving the efficiency of the infrastructure business for the benefit of consumers and taxpayers. This simply makes for low efficiency and higher costs for consumers and the government.

The attempt to privatize Telikom PNG Ltd (Telikom) illustrates this point. The sale has been embroiled in controversy since Telikom's Board switched from negotiating with Fiji Telecom, the preferred buyer, to Econet. Econet paid for 51% of the company when the Telikom Board undertook to reassess the value of Telikom's assets without the knowledge of the government team, headed by the Independent Public Business Corporation (IPBC), a body established to head the privatization process. The Board justified this on the basis that proper due diligence had not been carried out on Econet prior to finalizing the contract. This represents a loss of faith in the privatization body and a breakdown in communication between it and the Board. This has resulted in none of the bidders knowing which is preferred and all parties uncertain whether bids and the final deal will hold.

*6) Challenges for regional and national level coordination:* A number of regional initiatives have been proposed in the Pacific to help smaller countries overcome capacity and scale issues, but some have stalled or implementation has been delayed, often due to concerns about sovereignty or a lack of clarity on how individual country needs would be met in practice.

For example, the Pacific Island Air Services Agreement (PIASA) is aimed at helping to prepare Pacific countries for the gradual adoption of a region-wide 'open skies' regime. This has not yet eventuated due to some countries' concerns that this will erode the value of existing national carriers. More progress has been made on developing the Pacific Aviation Safety Office (PASO) initiative. However, this represents the end of a protracted process. The idea of a regional safety office was originally proposed at a regional aviation conference in 1995.

The need for greater regional coordination is also being imposed from outside the Pacific region in key areas. The demands of the US for countries exporting to the US to meet minimum customs clearance standards for anti-terrorism purposes is just the latest example where it would make considerable sense for small Pacific countries to band together to achieve economies of scale. Hygiene standards for agricultural exports to New Zealand and the EC are another example.

Box 7.2: Coordination has Costs

Effective coordination does contribute to good infrastructure performance, but this has costs. Coordination involves making trade-offs between multiple objectives, and balancing the strategies and priorities of multiple stakeholders. This takes time, effort, and involves compromise. In Pacific countries coordination costs are not insignificant. It is expensive and time consuming to achieve consensus between dispersed and disparate tribal groups. Competing or contradictory donor conditions make it more difficult to plan for the 'big picture'.

The following techniques can help to reduce coordination costs:

- Rules, programs and schedules can reduce planning time and help to ensure that all stakeholders understand how their role fits in with the overall strategy
- Delegate certain tasks or decisions to temporary sub-committees or task forces made up of people from multiple departments or interest groups
- Outsource complex or specialist tasks and analysis to experts
- Create 'liaison roles' – people who are charged with bridging the gaps between departments, Ministries or projects
- Make use of the internet and computer systems to share information.

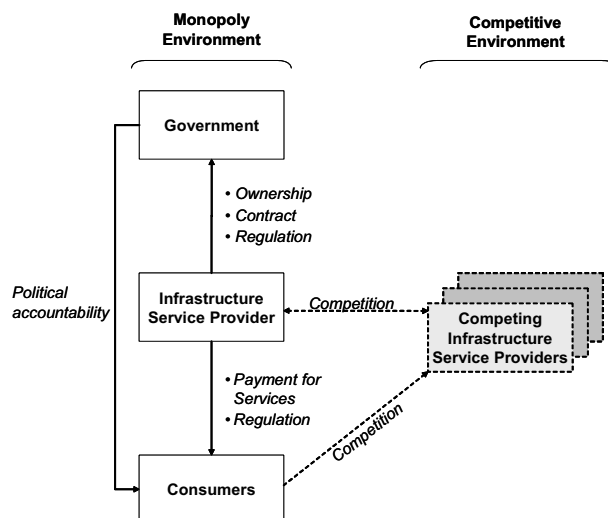
*Source: Castalia*

### 7.1.3 Lack of Good Governance and Accountability

Figure 6.1 illustrates the concept of accountability in infrastructure provision. The arrows indicate the direction of accountability:

- Infrastructure service providers are accountable to governments and/or consumers
- In a competitive environment, consumers can hold the service provider accountable for poor service by choosing another competing provider
- Where there is a monopoly provider, consumers have no way to hold it directly accountable by withdrawing their custom. If the monopoly is privately owned there should be a regulatory mechanism where the provider is required to account publicly for poor service. If the monopoly is owned by the government, accountability is invariably weakest as it depends on the willingness of the official or political representatives to deal with the problems of poor service in a transparent manner
- Governments often seek to control the service provider to deliver services consumers want through owning the assets and overseeing service provision, specifying service standards or tariff structures in a delegated management contract, or through regulating privately operated providers. These are weak forms of accountability unless there is a considerable arms length relationship with the service provider and the true costs of providing service with or without subsidy are transparent.

**Figure 7.1: Accountability in Infrastructure Services Provision**



*Source: Castalia*

Poor accountability has contributed towards poor infrastructure provision in Pacific countries. Pacific countries have few institutional arrangements or governance processes that encourage accountability in a transparent manner.

In general there is very little competition for services, in part because of size and geography, but also because the underlying infrastructure policy design is poor. Papua New Guinea and Samoa have competition in Internet Service Provision, and Tonga has a duopoly in mobile telecommunications. Samoa and Lae and Port Moresby ports in Papua New Guinea have competing port service providers and airport terminal services at Port Vila in Vanuatu and Koror in Palau are procured competitively.

The absence of competing service providers means that effective oversight mechanisms are essential to ensure monopoly providers operate efficiently, to price effectively and in a sustainable way, and to extend services. However, most infrastructure services are provided and sanctioned by the same entity, the government. Government departments are often financially constrained, inefficient and have limited specialist or technical human resources capacity. They also have little control over investment decisions and staffing. This is a weak model for accountability and has failed to provide incentives for good performance.

For example in Fiji, the Ministry of Public Works Department is responsible for providing water and sewerage services. The utility has no control over its budget, and the existing allocations from Government do not allow for system improvements and general maintenance. The utility's performance has been poor on most indicators, and worse than that of countries with fewer natural, financial and human resources.

Where there is lack of accountability and transparency in ownership structures, the problem is sometimes compounded by weak Court systems that provide little protection for infrastructure investors and operators. An important feature of any framework to allow infrastructure assets to be managed for the benefit of consumers and investors/operators, is access to truly independent courts which can protect contractual arrangements or interpret the law affecting infrastructure transparently and independent of any political or bureaucratic influence.

Some progress has been made in some Pacific nations where judges operating at Superior Court level are appointed from outside of the country. These judges bring



the independence and knowledge levels from other jurisdictions, and are not susceptible to the predations of political or other interference. This is a very useful example of regional coordination which is a crucial element of establishing the right framework for infrastructure investment.

Donors should also conform to an accountability framework. The lack of focus on creating sustainable investment in infrastructure discussed in the preceding section is driven in part by donor policies that have not encouraged accountability. Many donor agencies concentrate their programs on providing capital for new infrastructure, with an understanding that governments will make adequate provision in the annual budgets, or set up regulatory conditions which require full cost recovery (with or without subsidy) including adequate provision for depreciation and maintenance. All too often, this has not happened, with the result that infrastructure projects are not funded on a sustainable basis. While the original investment may be properly funded (which it usually is via donors), too often financial provision is not made for long term replacement of the assets through proper pricing and maintenance of the underlying assets.

Thus often donor-driven funding to the Pacific has sometimes created unintentional distortions by fostering the perception that capital is a 'free good' for the purchase of infrastructure investment. This runs the risk of creating the reaction from governments that the infrastructure can simply be run down over time to be replaced again in the future by further donor assistance. This sort of policy regime creates the wrong incentives for Pacific governments to invest wisely. Neither does it promote the most efficient use of infrastructure investment assets, where consumers should have to face realistic long term infrastructure prices. Alternatively, if prices are held below this level, then subsidies should be made explicit for the donors, the operators of the infrastructure assets, the government, the consumers and taxpayers to see.

While these unintentional distortions by donor infrastructure policies are features of poor outcomes, in the end failure occurs because of the poor policy framework within which infrastructure investment works. The responsibility for good design is not the donors' prime responsibility: It is the responsibility of respective governments which avail themselves of the capital for investment provided by donors.

Box 7.3: Expert Panels can Improve Accountability

Regulation helps to improve accountability when the private sector is involved in providing infrastructure services. But many Pacific countries are resource constrained, and may not have the skills or budget to implement an independent regulatory agency. Instead, some countries may benefit from regulating service provision through a contract. This is the approach adopted in Vanuatu, where water and electricity services are provided by a private operator, UNELCO. A government department is responsible for overseeing performance under the UNELCO contract.

While this approach may work well for most regulatory activities, it does not always provide the best incentives for accountability during periodic tariff reviews. Tariff reviews require a high level of expertise, discretion and judgment. It is important that tariff reviews are not subject to political influence. Shugart and Ballance suggest using independent, non-governmental Expert Panels for greater accountability. The key features of this concept are:

- The government does not have the power to unilaterally select the members of the Panel
- Candidates are shortlisted by a respected, independent, non government organization. Members are selected through a process involving the public authority and the utility, which have an equal say
- The Panel manages and ultimately decides on periodic tariff reviews
- The Panel also serves as an appeals body for any decisions taken by the regulatory authority.

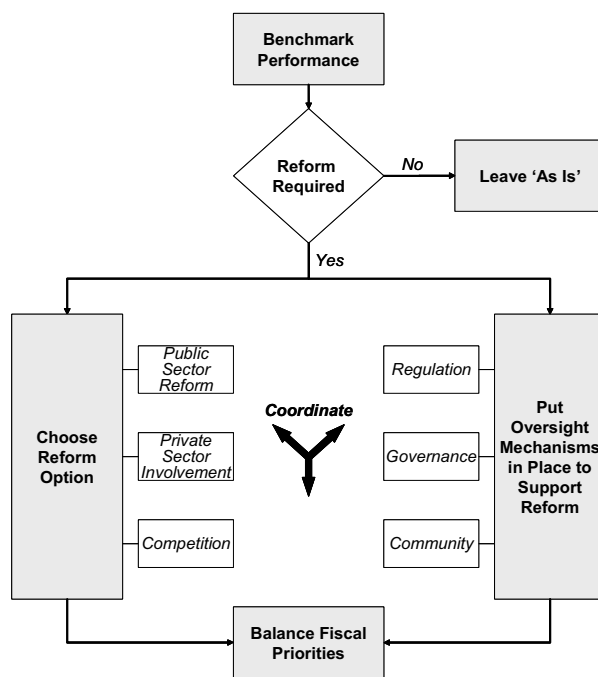
*Source: "Expert Panels: Regulating Water Companies in Developing Countries" C Shugart & T Ballance, June 2005*

## 7.2 There are Some Ways to Overcome these Barriers

Improved infrastructure will only be achieved and sustained in the long term with institutional arrangements and governance structures that offer incentives for good performance and provide for coordination.

In Figure 6.2 we propose a decision framework for infrastructure reform, which attempts to address barriers to coordination and accountability.

**Figure 7.2: Decision Framework for Sector Reform**



*Source: Castalia*

There are some key elements to this framework:

- The first step is to identify whether reform is actually necessary, and if so, what type of reform is required. Benchmarking sector performance against other Pacific and comparator countries will tell governments whether the sector is performing relatively well or relatively poorly. It will also identify the specific challenges to overcome in each sector, for which the reforms can then be designed. Where performance is acceptable, no reform is needed
- Depending on the specific issues identified, the next step is for governments to select the appropriate mix of reforms. These may include reforming the public sector, introducing private sector involvement, introducing competition or a regulatory regime which simulates competitive pressures where there are dominant or monopoly providers in the infrastructure marketplace, an independent Court system, or a mixture of these solutions
- Regardless of the reform option selected, governments need to put in place sufficient oversight mechanisms to encourage good performance and discourage poor performance. This may include independent performance audits, contract monitoring, regulation or community oversight
- The government needs to give infrastructure development appropriate priority in budget allocation, both to ensure an efficient mix of investment and maintenance, and to provide subsidies which achieve the “biggest bang for the buck” in terms of infrastructure outcomes
- Finally, all relevant policies, plans and implementation mechanisms must be fully coordinated. Regional coordination can help to overcome some of the natural challenges to good infrastructure performance faced by Pacific countries.

Some of these reforms have already been tried in the Pacific, with mixed success. We discuss each reform below, highlighting past successes or failures, and attempt to identify the criteria for success. Below, we examine the full suite of policies which, if consistently implemented, would result in:

- Improved rural infrastructure access
- More efficient service provision, and
- Appropriate pricing.

### 7.2.1 Benchmarking

Benchmarking infrastructure performance will help to identify whether reforms are actually necessary, and if so, in what areas.

Although this sounds straightforward, governments often embark on programs that include a ‘checklist’ of sector reforms, without stopping to consider whether each specific component is actually necessary. Benchmarking helps to avoid a ‘cookie cutter’ sector reform strategy, which may be unsuited to the specific issues a country faces.

Benchmarking involves measuring a company or utility’s performance against key performance indicators. IBNET<sup>16</sup>, (a benchmarking ‘start-up kit’, funded by DfID and managed by the World Bank), defines two forms of benchmarking:

- *Metric benchmarking*: Quantitative measurement of performance against other organizations over time. Metric benchmarking provides utilities with information on performance gaps. However, it does not always provide an indication of explanatory factors, such as geography, weather or social customs that impact performance
- *Process benchmarking*: The analysis of a utility’s own business processes and comparison with those of organizations with exemplary performance in those processes. Process benchmarking recognizes that the best performance for one utility may not be equal to the best performance of peer utilities, given a unique set of explanatory factors. It involves measuring the best performance that can be achieved under the particular constraints and circumstances that exist for a specific utility. This includes tracking the utility’s own performance over time to identify trends and improvements.

Regional benchmarking has already been initiated in the Pacific in the electricity and water sectors. Electricity utility performance is benchmarked annually, and WSS utilities are benchmarked every few years.

These programs have faced some challenges:

- Many utilities lack the human resources capacity to undertake the required data gathering, even on an annual basis
- Utilities do not adopt a common approach to measuring performance for each indicator; therefore comparisons are not always accurate.

Currently the benchmarking analysis and results are produced by the Pacific Power Association (PPA) and Pacific Water Association (PWA). The regional nature of these benchmarking initiatives does help to alleviate the capacity and capability constraints. The PPA is also helping to train utility staff on measuring performance to achieve more consistent results.

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<sup>16</sup> [www.ib-net.org](http://www.ib-net.org)

These benchmarking initiatives could be strengthened as a driver of efficiency and sector reform if the results were made public. Currently electricity sector benchmarking data can only be reviewed by PPA member organizations, and no member can publish this information. This has resulted in several separate benchmarking studies being carried out each time this sort of information is required.

Each time infrastructure performance information is needed, consultants, donors or lending agencies must request the information directly from each utility, creating a further capacity burden on countries with limited human resources. In addition, keeping the results confidential does not help to create the incentives for improved efficiency one could expect from such a program.

Other sectors would also benefit from benchmarking initiatives. If this were initiated, there would be value in considering a regional infrastructure benchmarking unit, which would take responsibility for developing measures, gathering consistent and accurate data, and publishing sector reports. A non-country specific unit of this nature would help to ensure objectivity, and would help to overcome capacity and capability constraints.

**Box 7.4: Examples of Successful Benchmarking**

**Performance benchmarking has been employed successfully in the water and sewerage sector in England and Wales. Utilities provide OFWAT (the regulator) with service performance data, which is then published in a set of ‘performance scorecards’. It has also been implemented successfully in Sao Paulo and Indonesia. Here, benchmarking brought about significant improvements in pollution levels, following the publication of industry ratings on environmental compliance.**

**Benchmarking has also been effective in the urban Water and Sanitation sector in Vietnam. Data were collected from 67 urban water companies, reviewed by the World Bank and the water utilities for consistency and reasonableness, and used to compile a performance baseline and performance targets for water utilities. These performance targets are being used to define the eligibility criteria of water utilities to access credit under the Vietnam Urban Water Supply Development Project.**

*Source: “Utility Benchmarking” B Kingdom and V Jagannathan, March 2001; IBNET Benchmarking in the Urban Water Sector Vietnam*

Developing an effective benchmarking program involves<sup>17</sup>:

- Choosing measurable and meaningful indicators of performance:
  - Some indicators may be expressed as indices that are adjusted for different operating conditions
  - Indicators should draw on data that can be relatively easily or reliably collected, and that are unambiguous
  - Indicators should reflect conditions over which the service providers have control
- Using an independent, international body to compile the data and analyze the results
- Communicating performance results in a way that will allow the public to make an informed assessment of relative performance, and set realistic expectations for improvements
- Publicizing the results
- Creating incentives and penalties that reward good service providers and encourage underperformers to improve.

<sup>17</sup> “Utility Benchmarking” Viewpoint, March 2001, B Kingdom and V Jagannathan

## 7.2.2 Choose an Appropriate Reform Option

The organizational structure through which infrastructure services are provided can have a critical effect on the efficiency of provision. Table 7.1 highlights the key features of the entities responsible for providing infrastructure services. They are presented in order of government involvement, ranging from complete government control and involvement on the far left, to private control and ownership, in the far right column.

**Table 7.1: Distinguishing Between Infrastructure Providers**

Feature	Government Department	Public Corporation	Corporatized Company	Private Sector Participation	Private Company
<b>Legal Basis</b>	Public finance and/or state sector legislation	Special Statute	Incorporated under company law	PSP Contract	Incorporated under company law
<b>Entity Ownership</b>	Government	Government	Government	Government	Private
<b>Assets &amp; Operations Ownership</b>	Government	Corporation	Corporation	Government or Private	Private
<b>Governance</b>	Government Ministry	Government appointed Board with objectives defined by Statute	Government appointed Board with profit making objectives	Board	Privately appointed Board
<b>Senior Mgt Appointments</b>	Government Ministry	Board Ministry may be involved	Board Ministry <b>may not</b> be involved	Board	Board
<b>Revenue Source</b>	Government Budget allocation or user charges	Charge customers for service	Charge customers for service	Charge customers for service	Charge customers for service
<b>Source of Finance</b>	Budget	Borrow from financial sector	Borrow from financial sector	Equity and debt	Equity and debt
<b>Budget Management</b>	Manage budget allocation	Responsible for managing own budget	Responsible for managing own budget	Responsible for managing own budget	Responsible for managing own budget
<b>Financial Targets</b>	None	Cover costs	Cover costs & make a return comparable to private businesses in the same sector	Cover costs & make a return comparable to private businesses in the same sector	Cover costs & make a return

*Source: Castalia*

Each entity provides different incentives for performance. Infrastructure services in the Pacific have traditionally been provided by government departments. This has not always resulted in good performance. Many governments have already recognized this problem, and have embarked on sector reforms.

Public corporations and corporatization are both examples of public sector reform. They are discussed together under the heading ‘Public Sector Reform’ below. Private sector involvement lies between public sector reform and full privatization, and is discussed in a separate section. Competition is also discussed separately. While it is a

reform option, we do not discuss privatization in detail, although we touch on private sector service provision under the heading of competition.

The institutional challenges differ along the continuum of organizational options. For example, smaller countries with strong informal tribal governance arrangements may find it more difficult to implement high quality corporatization and State Owned Enterprise models, since this requires clear separation of roles of government appointed Boards (which should pursue commercial objectives), and the government itself, pursuing a wide range of policy targets. Privatization and PSP contracts are better able to achieve the required arms-length separation in these settings. On the other hand, arrangements involving the private sector require high levels of skill for effective regulation.

When selecting a reform option, governments will need to think carefully about the whether the chosen approach is applicable to improving service to rural and remote areas as well as urban areas. In assessing reform options for rural areas, governments will need to analyze affordability and willingness to pay for services. It is likely that a different approach or even a different mix of services from those offered in urban centers may be more appropriate.

### **Public Sector Reform**

Most Pacific governments have initiated public sector reforms to address poor infrastructure sector performance. This has delivered mixed results.

Corporatization has been implemented in some Pacific countries and, where effectively implemented, has increased efficiency and revenue for operations and maintenance in various sectors. Corporatization has worked well with the PNG Water Board, in electricity supply in Fiji (see Box 7.5) and in the Samoa Ports Authority. However, in the water sector in Fiji, failure to achieve true separation from government by appointing a strong independent Board and management team, contributed to failed reforms.

Box 7.5: Public Sector Reforms in the Pacific

**This box contrasts two public sector reforms in the Pacific. We review two attempts at corporatization in Fiji – Fiji Electricity Authority and the Water Division in Fiji’s Public Works Department. The former attempt has been successful, while the latter attempt failed. We highlight reasons for success and discuss lessons for future reforms.**

Fiji Electricity Authority

Fiji Electricity Authority (FEA) is responsible for electricity supply, distribution, transmission and generation.

Prior to 2000, FEA faced significant problems. The company was unprofitable and faced capacity and efficiency problems in the face of increasing demand. A new Board was appointed in 2001, and targeted with restructuring the business and returning it to profitability in three years.

Major business reforms were implemented. These included a focus on improving efficiency, reducing losses and production costs, increasing labor productivity and implementing improved accounting practices.

Significant financial and operational improvements have been made in three years. US\$ 35 million in costs have been saved (annual business revenues are US\$ 70 million), staff numbers have been halved, systems losses have been reduced from 18 to 10 percent, efficient generators have been installed and engineering maintenance efficiency and collection maintenance efficiency have been improved. These have contributed to substantial revenue increases.

Fiji Public Works Department

The Water and Sewerage Department in Fiji’s Public Works Department is responsible for providing water and sanitation services.

In the late 1990s, two Technical Assistance projects were initiated to corporatize the Fiji Public Works Department. The aim was to establish a wholly Government-owned limited liability company, with clear commercial objectives, accountability and operational autonomy.

Recommendations were implemented “on paper”, but the water utility was soon returned to its original state as a Government department after the political upheaval in 1999 and 2000.

The government’s intention is to restructure the Water and Sewerage Department, internally improving operations to the point where it can function without additional Government funding, after which it will be corporatized.

These internal reforms have not yet delivered any performance improvements, and in some cases, the utility’s performance has deteriorated.

**These cases provide two very different examples of how public sector reforms are undertaken. The timing of the corporatization attempts was an important factor. FEA’s corporatization was initiated after the political upheaval, while the Public Works Authority’s corporatization was initiated just prior to this, and was overturned in the process.**

**That aside, the FEA’s corporatization can be contrasted with the Fijian Government’s attempt to first improve performance in the Water and Sewerage Department, before undertaking full reforms. This hasn’t worked. Key features of FEA’s success include:**

- **The Government’s willingness to support an independent, commercially focused Board and management team, with profit objectives**
- **Outsourcing larger diesel generation plants to the private sector under operator management contracts, allowed management to focus on improving efficiency in the rest of the business, while importing key skills and experience in generation**
- **The drive and capability of individuals on the Board and Senior Management team have been crucial to success.**

**By comparison, the Fiji Public Works Department has no independent decision making ability, no control of its own budget, and tariffs are held below cost and subsidized by the Government. Existing budget allocations from the Government do not allow for system improvements and general maintenance. There is therefore little incentive to radically transform performance.**

*Source: Castalia*



Appointing a strong, independent and experienced senior management team and Board is critical if increased accountability is to be achieved. Public sector reforms have been supported by technical assistance programs to strengthen capacity. These have also had mixed success.

For example, the ADB funded 15 Technical Assistance (TA) grants to help improve operations and financial performance of the water and sanitation sectors in four Pacific countries (Fiji, Kiribati, Marshall Islands and Papua New Guinea) between 1975 and 2002. In an evaluation of these TA's, the ADB reported some improvements, but noted that the projects had not completely delivered to expectations. This is in part due to a lack of focus on core Board or management competence. The study noted the following lessons:

- A change in corporate structure did not translate immediately into commercial focus, as these organizations lacked a culture of minimizing costs and generating revenue
- The success of efforts to establish or strengthen Boards of Directors is dependent on the qualifications of the elected members and the capability of these individuals to carry out their functions well
- The TAs focused on introducing KPIs for performance based management, but directors and managers did not always have the competence to understand and act upon data.

Although this study was water sector specific, these lessons are applicable to other attempts at infrastructure sector reform in the Pacific. They reflect the Pacific-specific challenge of a limited pool of resources, technical capability and capacity. However, the success of public sector reforms in infrastructure sectors in some Pacific countries suggests that these challenges can be overcome.

Key features of successful public sector reforms include:

- Government willingness to let the Board of a public corporation or corporatized entity operate independently
- Government willingness, in the case of a corporatized entity, to allow the organization to operate on a commercial basis, with a profit objective to provide for growth
- Transparent decision making by the Board and the management team
- Driven, independent and capable of senior management and Board members
- Board and government support for prices that cover full and reasonable costs, or explicit subsidies to make up any shortfall
- Ensuring there are appropriate oversight mechanisms in place

These characteristics represent a good model for successful public sector reform, and should be achievable for most Pacific countries. However, some may find it more difficult to appoint management or Board members with the required skills.

As discussed in section 6.2.2, some Pacific countries have a smaller pool of skills to draw upon due to small populations, youthful populations and outward migration.

There are some ways to alleviate this problem. One solution is to look beyond the borders of the country to the Diaspora<sup>18</sup>, or to try and attract skilled individuals from other countries. Low salaries are an impediment to attracting skilled workers. In most

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<sup>18</sup> Although as we note elsewhere in section 6.2.2 the potential supply of skilled labor from the Diaspora may not be large, and there are considerable difficulties in attracting back labor which is short supply in larger, higher income countries in the region.

Pacific countries, management salaries in public corporations or corporatized entities are set at the same level as government department officials. To attract the right people, it may be necessary to set remuneration at a higher level.

Governments may argue that this imposes an unnecessary additional financial burden on the service provider. However, if the appointed individual was able to turn the entity into an efficient unit which recovers its costs and provides good quality services, the benefits may far outweigh the costs. Another option is to employ managers on performance contracts, where extra pay is linked to actual performance to drive improvements.

Another impediment to good public sector reform in many Pacific countries is government reluctance to support staff layoffs. Because job opportunities are limited in many Pacific countries, this is a particularly sensitive issue for many governments. However, keeping staff on who do not add any value, or forcing organizations to re-appoint staff that have already been made redundant (such as was the case in the airports sector in Fiji), provides very poor incentives for efficiency and improved performance. Governments would do better to support leaner service providers, while providing support to ex-staff members and other individuals to develop small businesses that compete to provide important contract services. This initiative was employed successfully by Fiji's electricity authority when trying to reduce staff numbers to an efficient level. A number of staff took voluntary redundancy packages, and now provide services to the utility on a contract basis.

If staff layoffs are too disruptive and politically unacceptable and keeping staff on is a stated 'social obligation cost', then governments should support service providers keeping these staff on at a minimum wage and changing their roles to better suit their skills. This is the strategy employed at Nadi airport. Airport management were not allowed to make cleaning staff redundant, so they were redeployed to perform other 'value-added' activities, such as porter services or serenading services for arriving tourists. While this does not get rid of the financial burden imposed by employing more staff than is necessary for efficient operation, it does not continue to reward existing staff for work they are unsuited to and are not skilled at and offers some incentives for improved performance.

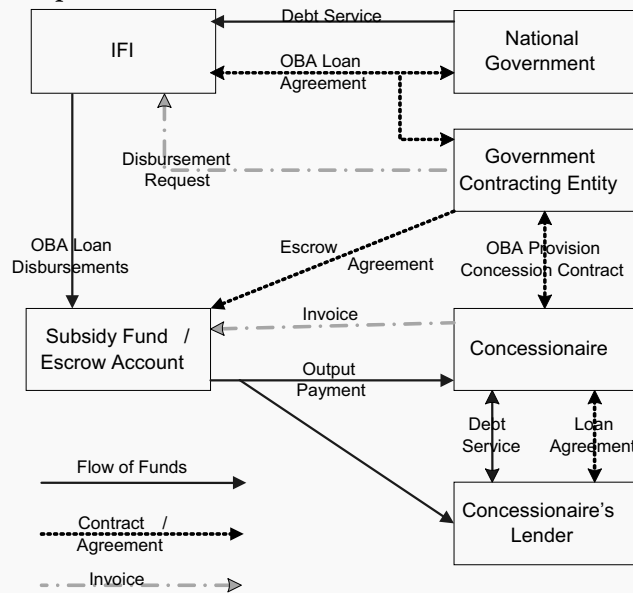
Output Based Aid (OBA) programs can help to make Public Sector Reforms more successful. Output Based Aid is an innovative way of delivering targeted subsidies. It differs from conventional subsidy mechanisms in that the subsidy payment is tied to the delivery of a specific output, for example installing a water connection. OBA mechanisms are discussed in more detail in Box 7.6.

Box 7.6: Output Based Aid Mechanisms

The figure below illustrates a contracting structure and the flow of funds in a typical OBA arrangement.

To design a successful OBA scheme, it is necessary to design rules that answer the following questions:

- **What is the trigger for the subsidy payment?** This answer to this question defines what the desired output is, and how to ensure that the output has been delivered
- **Who is entitled to the subsidy?** This question aims to define consumers' ability to pay, and therefore, whether they should receive the subsidy or not. This question can be answered through a survey of target groups within the population
- **How much subsidy are they entitled to?** This question highlights the difference between the consumer's ability to pay and the cost of providing the subsidized output. It is essential to determine that the proposed cost of providing the subsidized output is a true and fair cost.



An institution, or multiple institutions need to manage the following aspects of the OBA scheme to ensure it functions effectively:

- The correct and fair application of the OBA rules
- The flow of monetary funds.

There are a number of ways to structure the procedures and implementation of the OBA mechanism. Whichever option is selected, it should link subsidy payment to outputs, and should provide security to the operator or contractor that subsidies will be paid on time and in the pre-agreed amounts.

*Source: Castalia*

**Private Sector Participation**

Involving the private sector is an alternative to public sector reform, although relatively few Pacific governments have chosen to exercise this option in infrastructure.

As shown in Table 7.1, under a private sector participation (PSP) model, the government retains overall ownership (and therefore control) of the infrastructure assets, and contracts with a private firm to manage the systems and deliver the infrastructure services to customers.

There are three classic types of private participation contract:

- **Concession Contract:** This contract is most closely related to privatization. Under this contract, the concessionaire is responsible for all aspects of service provision and its shareholder(s) or parent company is rewarded with profit from the utility, after all operating and debt service costs are paid. Vanuatu has a concession in place for water and electricity services, and Papua New Guinea has a concession in place for water services
- **Lease Contract:** In a lease contract, the government retains responsibility for planning and financing capital expenditure. The private operator is responsible for meeting agreed service standards that are achievable with the available assets. Tariff revenues are split in two: The first part covers operating and maintenance costs. This goes to the private operator. The second part goes to the public sector to help finance additional investment
- **Management Contract:** Under a management contract, the private operator is typically paid a fixed fee for managing the utility, plus a performance fee for meeting financial and service improvement targets. It is the targets and payments in the management contract that determine how the operator directs the utility's performance.

While there are relatively few examples of private sector involvement in the Pacific, experience in some comparator countries has shown that this can help to improve infrastructure performance. Caribbean countries have significant private ownership or operation of electricity utilities or telecommunications companies, as well as private investment in roads, airports, ports and airlines. Private involvement has helped these countries to expand access, finance investment, boost efficiency, and limit government risk. However, poorly planned public-private partnerships have resulted in governments having to take back risks and costs they believed they had transferred.

In the Pacific, Fiji has had success in outsourcing electricity generation, Vanuatu's decision to engage a private operator to deliver water and electricity services under a concession contract has resulted in some of the most efficient services in the region. Ports in Samoa have benefited from adopting a 'landlord' model, in which port services are provided by private companies.

There are also examples where private sector involvement has been less successful. Some reports suggest that the concession arrangement for Papua New Guinea's water utility in Port Moresby, 'Eda Ranu', has failed to deliver to expectations. Problems in the tender process, and a flawed contract which gave the operator responsibility for the supply, but not the distribution side of the water system, have been noted as some of the reasons for poor performance. Private sector involvement in the telecommunications sector has also failed to produce good performance, where long term exclusive licenses are awarded (see Box 7.7).

Box 7.7: Private Sector Involvement in Telecommunications

A number of Pacific countries have involved the private sector in providing telecommunications services. In most cases, a private sector company has partnered with the government (e.g. Fiji's FINTEL or Telecom Vanuatu Limited), or with other private investors (e.g. Solomon Telekom Company (ST)) to provide telecommunications services.

These companies have traditionally been granted an exclusive, long term operating license, which can be reviewed at certain intervals. These monopoly arrangements have inhibited growth in the telecommunications sector. The Solomon Islands experience provides an example of how this occurs.

The Government of Solomon Islands (GoSI) entered into a telecommunications license with Solomon Telekom Company (ST). ST is a joint venture of the Solomon Islands National Provident Fund (51%), Cable & Wireless (41.9%) and the Investment Corporation of the Solomon Islands (7.1%). The License grants ST exclusive operating rights for all telecommunications services. The License provides for a review of the terms on a five yearly basis.

This arrangement has failed to produce good performance:

- Total teledensity levels are among the lowest in the region
- Services are limited to the main city - approximately 90% of the market is in Honiara
- International and mobile calling costs, and internet access prices are among the highest in the region.

One of the principle reasons for this poor performance is a lack of accountability. Some of the key issues are:

- The exclusive long term License does not allow for competition or interconnection
- The License does not stipulate any investment obligation for the operator. It mentions a community service obligation, but does not set specific coverage targets. There is therefore little incentive to extend service
- The government lacks detailed technical knowledge and understanding of the sector and is therefore unable to regulate the operator effectively.

GoSI has initiated a telecommunications sector reforms as part of a comprehensive economic reform program, in which it aims to address these issues. Renegotiating the License when it comes up for review in 2008 is a priority, and will include and evaluating options for revising the exclusive nature of this agreement.

*Source: World Bank, Castalia research and interviews*

Key features of successful public sector involvement include:

- Selecting a PSP contract that matches the sector specific problems. For example, if a key issue is management skills and capability, then a management contract may be a good solution. If a utility lacks both adequate management skills and requires significant investment to turn performance around, then a concession contract may be a better option
- Careful contract design to ensure that:
  - Responsibilities are clearly allocated
  - Operator incentives will drive expected performance
  - The contract takes account of the specific social and political context in the country
  - There are clear provisions for dispute resolution
- Ensuring there are appropriate oversight mechanisms in place.

While private sector involvement may provide good incentives for improved performance, Pacific countries face some challenges to implementing this successfully.

1) *Pacific countries are small and remote*: Small countries with small markets, far away from major trading ports are less attractive to the private sector due to lower revenues. This could make it more difficult for some Pacific islands, such as the Micronesian or Polynesian countries, to attract sufficient private sector interest to make this a reform option.

However, we in fact observe considerable private sector interest in many Pacific markets, including in smaller nations. Private operators are providing services in the telecommunications sector in Tonga, shipping services in the Marshall Islands, and port and airport services in countries like Samoa, Vanuatu and Palau. In Kiribati at least three private operators have indicated interest in producing power as Independent Power Producers (IPPs) and there are already IPPs operating in the Federated States of Micronesia and in Fiji. This suggests that private sector interest exists even for small countries, and may eventuate if only it was encouraged.

Clearly small countries are less attractive to big international operators than large, high profile countries like China. But the evidence shows that in many cases private firms would gladly take the opportunity to provide service. We recommend that rather than assuming that there is no private interest, Pacific Governments should actively pursue PSP opportunities, preferably with the help of experienced transaction advisors.

2) *Private sector involvement may raise already high unit costs of providing service*: Since private operators need to earn profits, some policy makers are concerned that costs will increase, or that if the market is small, a private provider will be able to charge monopoly prices. In fact, the evidence from both the Pacific and the Caribbean shows that private providers are generally more efficient than public companies. Vanuatu's electricity prices are lower than Tonga and Kiribati's, both of which provide service through a publicly owned utility.

Allowing publicly-owned utilities not to earn a commercial rate of return on their capital is equivalent to providing them with an implicit taxpayer subsidy. If the same level of subsidy was explicitly applied to private providers, their prices would be correspondingly lower.

In any case, there is no evidence that publicly-owned utilities are any less prone to taking advantage of their monopoly status. The difference, typically, is that public utilities dissipate this through inefficiencies, while private entities see to maximize profits for their owners.

Regardless of whether subsidies are provided or not, governments will need to ensure appropriate oversight mechanisms are in place to keep prices at reasonable levels.

3) *Private participation may not be politically feasible*: Governments are often unwilling to involve the private sector, fearing loss of control. Private participation may lead to disruptive job losses. It may also reduce the government's ability to control the distribution of benefits in society, such as determining which communities get services, who does not have to pay their bill, who is awarded construction contracts, and the like.

Well designed private participation should create enough benefits to be politically attractive, but the reality is that private participation is risky, and governments are often not willing to risk changes to systems which, even if they do not work very well, are at least familiar and controllable. If this is the case, the only option available will be public sector involvement.

## Competition

There is very little competition in Pacific infrastructure, but it has been effective in encouraging performance improvements in certain sectors despite small scale.

In the telecommunications sector, while small scale prohibits implementing more than one fixed line network, mobile, international and internet services can be liberalized. International experience has shown that liberalization can significantly improve performance, even in small countries (see Box 7.8). Pacific countries that have tried this have experienced increased teledensity levels and reduced prices, for example in such as Tonga for mobile telephony, and Samoa for internet services provision.

### Box 7.8: The Effects of Competition on Telecommunications Performance

**The Caribbean provides an example of the benefits of competition in the telecommunications sector in small island countries.**

In the early 1990s, many Caribbean countries were becoming dissatisfied with slow expansion of telephone service. At the same time, these countries realized that high international calling charges and internet costs were a barrier to growth, particularly for countries focused on developing the service sector.

In response to these pressures, Caribbean governments began to liberalize their telecommunications sectors. The Dominican Republic and Jamaica were the first to introduce pro-competitive legislation and regulation. Jamaica first liberalized internet service provision. This was followed by liberalization of mobile telecommunications. Three new licenses were auctioned and an interconnection regime controlled by the Organization of Utilities Regulators (OUR) was established. A three year rate rebalancing plan was implemented, bringing down international rates and increasing local calling charges, after which international calling was opened to competition. The Eastern Caribbean countries followed with similar reforms a few years later.

Liberalization led to a remarkable increase in total access to telecommunications services, driven mainly by exponential growth rates in mobile phone use. Internet costs, international calling costs and mobile charges have all fallen dramatically with the introduction of competition.

In the Pacific, few countries allow competition in the telecommunications sector. However, developments in the Samoan telecommunications sector suggest that liberalization could have similar effects.

In the past, Samoa has demonstrated relatively low levels of fixed line and mobile access. However, following a recent government announcement that it would introduce competition in the sector, the market size has increased substantially and both fixed and mobile operator performance has improved.

After this announcement, the mobile operator - Telecom Samoa Cellular - more than doubled its customer base, added new products and services and introduced a pre-paid platform. The fixed line operator - SamoaTel - has also substantially increased its customer base. Total customer numbers (fixed and mobile) increased from 22,150 to 30,000 from the end of 2003 to the end of 2004 alone.

*Source: World Bank, Castalia Research*

Air services would also benefit from more competition. The international experience is that liberalization can reduce fares and increase volumes, providing a boost to business and tourism. Many of the Pacific carriers either operate at a loss or are only marginally economic. Most countries retain their flag carriers as a means to ensure continuity of air service, but this is not always financially sustainable. Open skies, or multilateral air services agreements will encourage competition, providing greater choice and lower fares for passengers. State-owned flag-carriers could then be privatized (or shut down if they are unable to compete with other carriers). If governments feared that a liberalized aviation policy might result in key routes being unserved, they could competitively award contracts to serve those routes in exchange for a subsidy payment.

Full competition may not be achievable in natural monopoly sectors such as piped water and sanitation and electricity distribution. Here, a competitive environment can be simulated by inviting private operators to bid for contracts to provide the service for a fixed term. This has worked in the roads sector in Fiji and Samoa, where maintenance has been contracted to the private sector. It has also been employed in the ports and airports sectors. Ports in Samoa and Papua New Guinea both contract out stevedoring services to competing private operators. A number of airports in the Pacific put various terminal services out to competitive tender.

### **7.2.3 Put in Place Oversight Mechanisms to Support Reform**

Accountability is vital to improved sector performance. When government departments provide infrastructure services, accountability is weak, because the same body is generally responsible for providing and sanctioning service.

All the sector reform options discussed here aim to resolve this problem by introducing an ‘arms length’ relationship between the service provider and the governing authority. Regardless of which option is selected, it is imperative to support the reform by putting in place oversight mechanisms to monitor performance, to encourage good performance and to punish poor performance.

In a public corporation or a corporatized institution a strong, well functioning Board traditionally has oversight for ensuring the company performs to expected objectives and can call upon management to account for instances where this does not happen. The Board is in turn accountable to Government.

Under the private sector participation reform model, accountability may be encouraged through establishing a contract monitoring unit. This unit would be responsible for overseeing operator performance and ensuring that it meets agreed objectives. Changes to the contract would have to be re-negotiated between the government and the operator. For example, the Government of Vanuatu’s Energy Unit performs this function by overseeing the concession contracts with UNELCO.

Competition in infrastructure service provision also requires oversight to ensure that providers don’t collude, prices remain fair and reasonable, and customers receive the type and quality of service they need. This may be carried out by a competition authority, a consumer protection authority and/or a regulatory authority.

It is often thought that both competition and private sector involvement require an independent regulator. This is a challenge for Pacific countries. Small size, and limited financial and human resources constrain their ability to create separate independent regulators. However, regulation does not necessarily imply a regulator. In the case of private sector involvement, a contract monitoring unit may perform core regulatory functions and monitor performance against other contract-specific clauses very adequately. In other cases, building capacity within the Ministry to enable it to oversee the operator’s performance may be sufficient to improve performance.



Making use of regional bodies can also help to overcome individual country capacity constraints for oversight functions. PASO is a good example of such an organization in the Pacific. This organization is similar to the Organization of Eastern Caribbean States (OECS) Civil Aviation Authority which helps member countries to maintain international standards of safety and security in the aviation and airports sector.

ECTEL, the telecommunications regulatory agency for a number of Eastern Caribbean countries, is another good example of a regional body promoting coordination and increasing accountability through creating an oversight mechanism that overcomes human resource constraints (see Box 7.9).

Public benchmarking information on how utilities and other infrastructure service providers compare against one another also encourages accountability.

Communities can also help to provide oversight at the local level. If community leaders are included in the planning and prioritization process, they can be made responsible for overseeing contractor performance or supporting reforms.

Finally, no sector reform option is going to result in an overnight transformation of infrastructure performance. These reforms will require donor support. In addition, in some Pacific countries, even if sector reforms are undertaken to the letter, and best practice is adopted, there may still be a need for continued subsidies and donor assistance. Although they may have contributed to weak accountability and poor coordination in the past, donor and multilateral lending agencies are in a position to encourage increased accountability within the Pacific region. These agencies form yet another possible oversight mechanism.

#### **7.2.4 Strengthen the Public Sector**

None of these reforms will be achievable without a strong public sector, or without the political will to reform and possibly commit to higher prices if necessary.

Private sector involvement is not a substitute for public sector reform, because this option requires a strong interface with the government. Lack of attention to the public-private interface is one of the reasons PSP initiatives often fail because the institutional boundaries become blurred. For example, under a management contract, the private sector management team typically reports to the public sector Board of a public utility. The interaction between the public and private sector takes place within the institutional setting of a utility, with the line between management and governance being inevitably less precise than what either the public or the private party would prefer. The interactions between management and governance levels within an organization are subtle, and can not easily be specified in a contract.

Similar problems exist under lease contracts. Asset owners and operators can have genuine and legitimate disagreements about the optimal level of investment, as well as having disagreements prompted by their different interests. Sophisticated and skilled interaction is required to manage such disagreements on an ongoing basis. The way these disagreements are resolved cannot be specified in a contract, and the quality of the outcomes depends as much on the capability of the public sector as on the contract design.

Under a full concession, the interface between public and private sectors can be reduced to the key service standards and tariff setting rules specified in the contract or enforced by the regulator. Even this is far from easy. It requires good quality regulation and oversight mechanisms to implement consistent and predictable policies.

Strengthening the public sector will be a critical part of any infrastructure reforms in the Pacific.

### 7.2.5 Regional Coordination

One option for overcoming the challenge of geographic dispersion, low population density, low skill levels, and inadequately resourced policy or institutional frameworks is to build capacity and size from a far greater degree of regional cooperation.

There are a number of regional bodies for some infrastructure sectors which are discussed in the relevant sector chapters. To date the success of these bodies in obtaining regional cooperation has been patchy. Nevertheless, there has been a drive in recent years by political leaders in the region to improve coordination and integration. This has been driven by declining economic performance in many countries of the region, by deteriorating security and political stability in some countries, and by a realization that the region's countries have to work together to deal with an increasingly global world.

The principle organization in the Pacific region for regional coordination and cooperation is the Pacific Forum based in Fiji. The Forum has the wide membership for establishing regional cooperation. Member countries are: The Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, Nauru, Niue, Palau, Papua New Guinea, Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu, Australia, and New Zealand.

While the Forum is an international entity operating at a high level, it is in the process of establishing, or has established, a number of regional operational entities designed to secure cooperation at a practical level. For example, it is intended to establish a regional Pacific Aviation Safety Office by 2008, and to support the role of the private sector through a Regional Private Sector Organization (RPSO).

The leaders of the Forum (at Prime Ministerial level) are to consider in October 2005, three concepts of regional cooperation and integration:<sup>19</sup>

- **“Regional Cooperation:** Setting up dialogues or processes between governments. Regional cooperation means services (eg. health, statistics, audit, etc) are provided nationally, but often with increased coordination of policies between countries. This is either based on an agreed strategy – such as the Forum Principles on Regional Transport Services – or arranged through a coordinating body, such as the Oceania Customs Organization
- **Regional Provision of Public Goods/Services:** Pooling national services (eg. customs, health, education, sport, etc) at the regional level. Governments are freed from daily management of some services and can concentrate on service delivery in other areas and on policy development. For example, by providing tertiary education through the University of the South Pacific (USP), Pacific Island governments can focus more on ensuring their individual primary and secondary education systems cater to their unique national needs
- **Regional Integration:** Lowering market barriers between countries. These barriers may be physical (e.g. borders) or technical (e.g. quarantine measures, import taxes, passport requirements, etc). Regional integration can improve access for Pacific businesses to consumers, increasing economies of scale and, therefore, reducing prices and making more goods available”.

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<sup>19</sup> Final Draft – A Pacific Plan for Strengthening Regional Cooperation and Integration, Pacific Islands Forum Secretariat September 2005

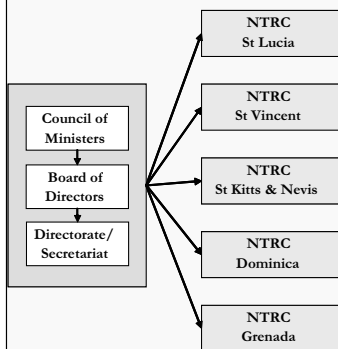
Pacific countries are grappling with regional issues more resolutely than for many years, but there is still a long way to go before the region can be held up as a best practice example of regional cooperation or integration.

There are however real opportunities for international donor agencies to “piggy-back” on the work of the Forum and seek to establish workable relationships with the Secretariat as a way of getting better coordination of infrastructure investment policies. Indeed, there is a clear confluence of interests between the donor agencies and the countries of the region to formulate a consistent and transparent policy framework for building, operating and funding infrastructure on a sustainable basis for the region, with common principles and governance arrangements.

There is also scope for regionalizing the regulatory framework for infrastructure assets, either in the form of a support agency to assist in building and retaining the human capacity of the regulatory institutions in each country, or to actually operate across countries as the infrastructure regulator for the region.

Box 7.9: ECTEL – Regulatory Cooperation in Eastern Caribbean States

The Eastern Caribbean Telecommunications Authority (ECTEL) was established as a regional telecommunications regulatory advisory body by the Governments of five Eastern Caribbean states (Dominica, Grenada, St Kitts and Nevis, St Lucia and St Vincent and the Grenadines). ECTEL’s responsibility is to coordinate the approach to telecommunications regulation in each member state. It works closely with telecommunications regulators and governments in each state, advising them on: regional policy, types of telecommunications services, licensing, fees, pricing, management and provision of universal service. The National Telecommunications Regulatory Commissions (NTRC) are the telecommunications regulators in each of the five member states. Each of these Commissions have five commissioners appointed by the Minister as well as varying levels of technical staff. The diagram illustrates the ECTEL’s structure



(left) and its relationship with the NTRCs:

*Council of Ministers: This group is made up of the Ministers responsible for telecommunications in the ECTEL states and the Director General of the OECS.*

*Board of Directors: One member from each member state appointed by the Minister for a year*

*Directorate/Secretariat: Managing Director, Professional, Technical and Support Staff*

ECTEL has helped with early termination of monopoly licenses, introduction of competition, and setting cost based tariffs and interconnection charges. Regional cooperation in regulation has enabled ECTEL member countries to manage scarce resources efficiently and leverage the inter-member country networks efficiently resulting in increased flexibility. ECTEL’s existence has provided a basis for a strong, unified approach to attracting investment and competition into the region. Rates for telecommunications services have begun to fall, applications for operating licenses are being processed and applications for the establishment of call centers have been received. Where possible, ECTEL endeavors to enact identical regulations in member states and to implement them consistently. This has reduced the burden on individual regulators and has helped to attract investment.

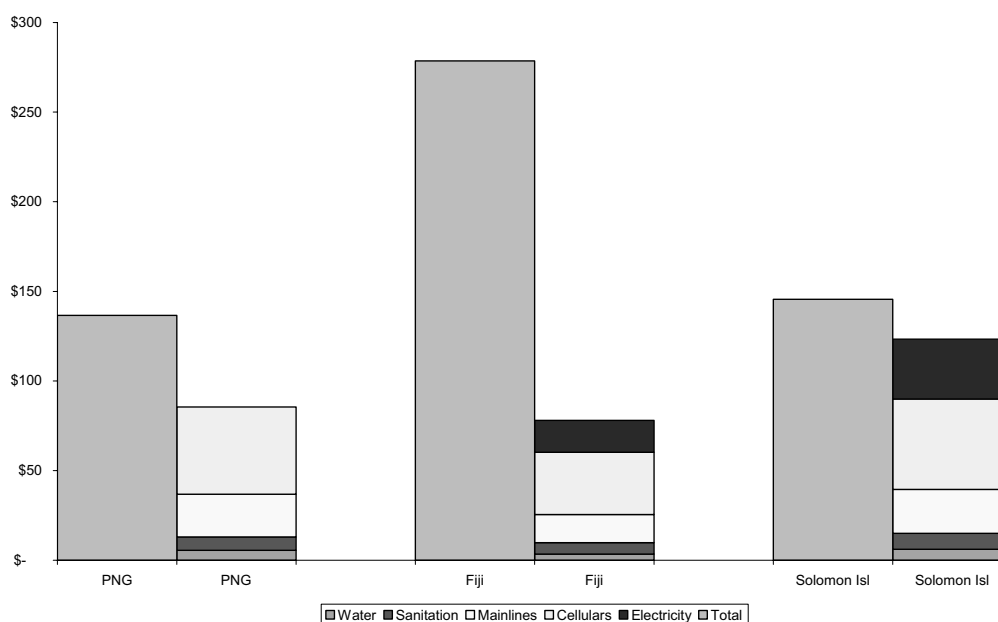
*Source: Castalia Research*

## 8 What's the Size of the Challenge

Improving access to and the quality of infrastructure will require considerable investment. This section estimates the likely levels of investment that would be required to achieve Millennium Development Goals or other reasonable infrastructure access objectives. Such calculations are, of course, never precise. However, they provide a useful indication of the scale of the challenge. We also compare the targeted levels of future infrastructure investment to recent investment performance. This provides us with the context for considering how the required investments may be funded.

The figure below summarizes our key findings by comparing the sum of annual per capita investments required for water and sanitation, electricity, telecommunications and roads with the total *per capita* investment for selected Pacific countries for the most recent year for which statistics are available<sup>20</sup>.

**Figure 8.1: Estimated Annual Investment Requirements for Infrastructure Sectors compared to Total Investment in 2003**



Source: International Financial Statistics (IMF)

The scale of the infrastructure challenge varies among the Pacific Island states, but it is significant everywhere. If total investment levels were to be maintained at their current levels, a significant re-allocation of resources would be required. Fiji, which has enjoyed relatively high levels of total investment due to its strong tourism and manufacturing sectors, would need to devote about 25 percent of those investments to the infrastructure sectors. At the other extreme, Solomon Islands would need to allocate almost their entire current investment spending to infrastructure.

To combine improvements in infrastructure access with growth in other sectors of the economy, all Pacific countries would need to achieve strong increases in their total levels of investment. This would require mobilization of private savings – both domestic and international, improved functioning of the financial sectors, and a change in fiscal priorities.

<sup>20</sup> Total investment is Fixed Capital Formation, derived from the International Financial Statistics (IMF).

The following sections present our estimates of the total investment needs for the water and sanitation, electricity, telecommunications and roads sectors. We note that our estimates of the total infrastructure investment needs are understated by the amounts needed for these sectors. We have not been able to find reliable estimates for the expected investment needs in ports, shipping, airports and air services. Such investments will be driven in part by commercial considerations about the level of demand for various services, and the quality expected by customers.

## 8.1 Water and Sanitation

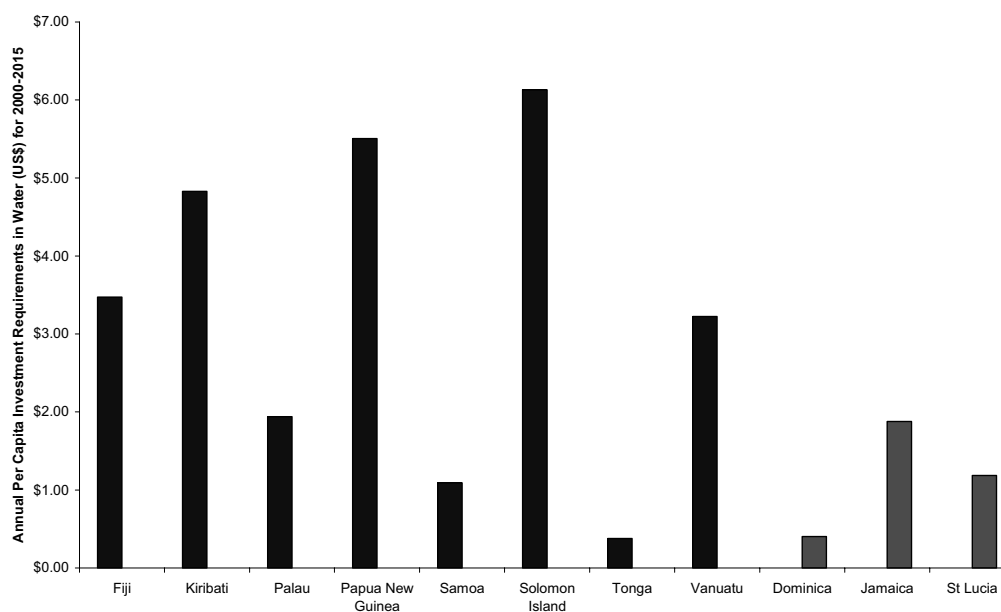
Our estimates of investment required in improved access to water, are based on the service target levels set by the Millennium Development Goals (MDG). MDGs require halving the percentage of population without access to improved water supply by 2015. We use current estimates of the number of households without access to improved water and population growth projections to calculate the additional number of connections required over the 10 year period. Population projections were obtained from the UN Urbanization Projections.

The unit cost of connecting a household to water was estimated at US\$400.<sup>21</sup> This estimate is perhaps a higher-end figure given that access can be increased through various forms of improved water supply (e.g. household connection, public standpipe, private standpipe, etc), and not only household connections.

We then apply a similar logic to estimating the investment requirement for wastewater and sanitation. Our calculations are based on an average per connection cost of US\$700.

Overall, significantly higher investment levels per capita are required to reach MDGs in wastewater and sanitation than in access to water. In general, richer countries require less investment since they already provide access to a relatively high proportion of their population. Fiji is an exception to this trend, with some of the highest per capita investment requirements among the Pacific Island states, despite being among the richest. This is explained by the low starting levels of coverage.

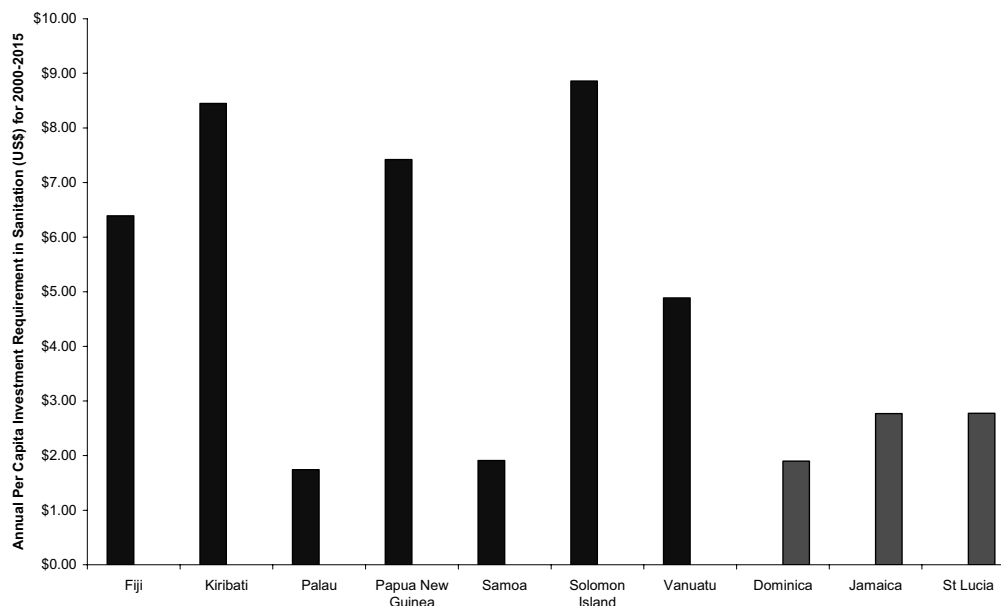
**Figure 8.2: Annual Per Capita Investment Requirement in Water to reach MDG**



Source: Castalia Research

<sup>21</sup> The unit cost of connection was obtained from the World Bank Policy Research Paper 3102, July 2003, "Investing in Infrastructure: What is Needed from 2000 to 2010" by Marianne Fay, and Tito Yepes.

**Figure 8.3: Annual Per Capita Investment Requirement in Sanitation to reach MDG**



*Source: Castalia Research*

We note that the investment challenge in the water and sanitation sectors in the Pacific is considerably higher than the comparable challenge in the Caribbean.

## 8.2 Electricity

Investments needed for improving access to electricity include both network extension and additional generation to accommodate demand from additional customers. We reference network extension targets to the MDG objective of halving the number of people without access. We focus on a selected group of Pacific countries for which information was available.

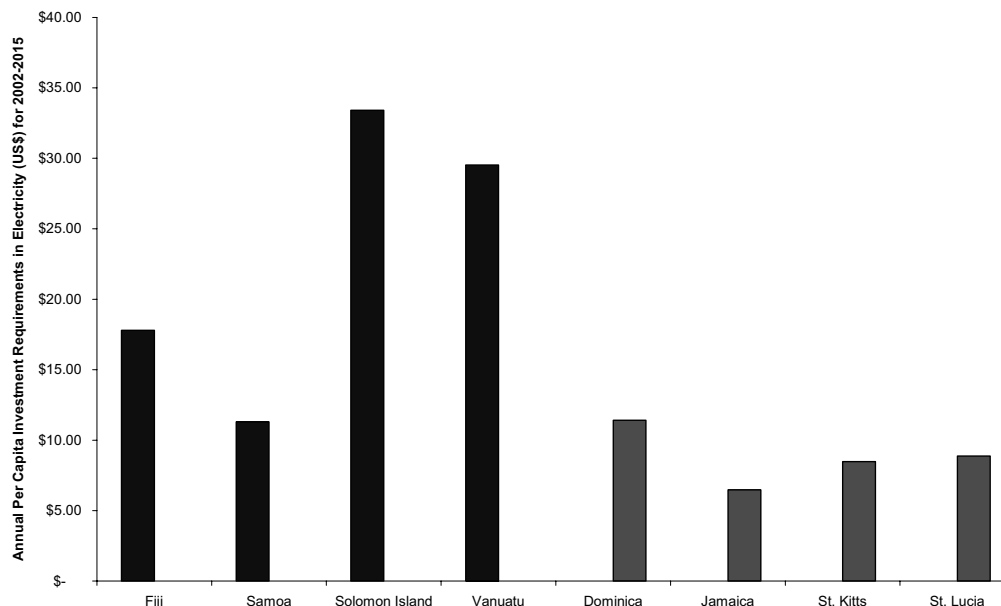
We use electricity intensity (kWh of energy delivered per customer) as a basis for calculating the investment requirement. The average electricity intensity for the group of Pacific countries for which data were available is 1.2 MWh, compared to 2MWh per capita in the Caribbean. This would suggest that energy intensity in the Pacific is likely to rise as service levels improve. However, we assume constant energy intensity as a baseline for calculating the minimum investment requirement.

We use the population projections for 2015, and the MDG service target, to estimate the required increase in the number of connected customers. Population projections were obtained from the UN Urbanization Prospects. Using the assumption of constant electricity intensity, we then compute the required increase in installed generation capacity.

The total investment required to deliver the increase in capacity was calculated on the basis of US\$1,900/ kW cost for generation capacity and the associated network.<sup>22</sup>

<sup>22</sup> The unit cost of \$US1,900 per kilowatt of generating capacity, including associated network cost, was obtained from the World Bank Policy Research Working Paper 3102, July 2003, "Investing in Infrastructure: What is Needed from 2000 to 2010" from Marianne Fay, and Tito Yepes.

**Figure 8.4: Annual Per Capita Investment Requirements in Electricity to reach MDG**



*Source: Castalia Research*

Again, the overall challenge of achieving the electrification targets in the Pacific appears to be higher than in the comparator countries in the Caribbean. Solomon Islands face the highest investment requirement of \$34 per capita per annum.

### **8.3 Telecommunications**

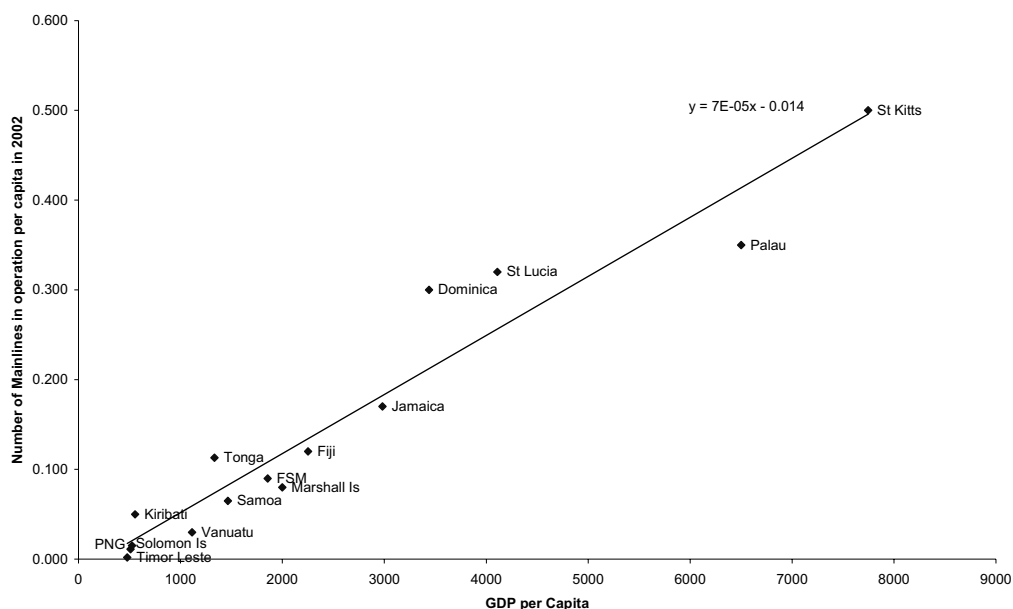
Unlike water, sanitation and electricity sectors, there is no-straight forward way to apply the MDGs to the telecommunications sector. Hence, we first need to consider what would be an appropriate target for telecommunications access in the Pacific.

We consider two possible targets, providing the two opposite ends of the range within which the investment requirements in telecommunication may fall. The minimum target is based on each country in the Pacific reaching the level of access consistent with the trend relationship between access and per capita GDP. The upper target is based on access levels matching those in New Zealand. New Zealand is also a remote economy with dispersed population, and hence the importance of telecommunications for economic development in New Zealand is likely to reflect its value in the Pacific Islands.

Our calculation of the trend relationship between lines per capita and per capita GDP is illustrated in Figure 8.5 below. For Pacific Island countries which fall below the trend line, we define the target as reaching the level of access indicated by the intersection of the trend line with their per capita GDP level.

The upper target corresponds to the New Zealand access levels of 0.466 mainlines per person and 0.647 cellular connections per person.

**Figure 8.5: Mainlines Trend**



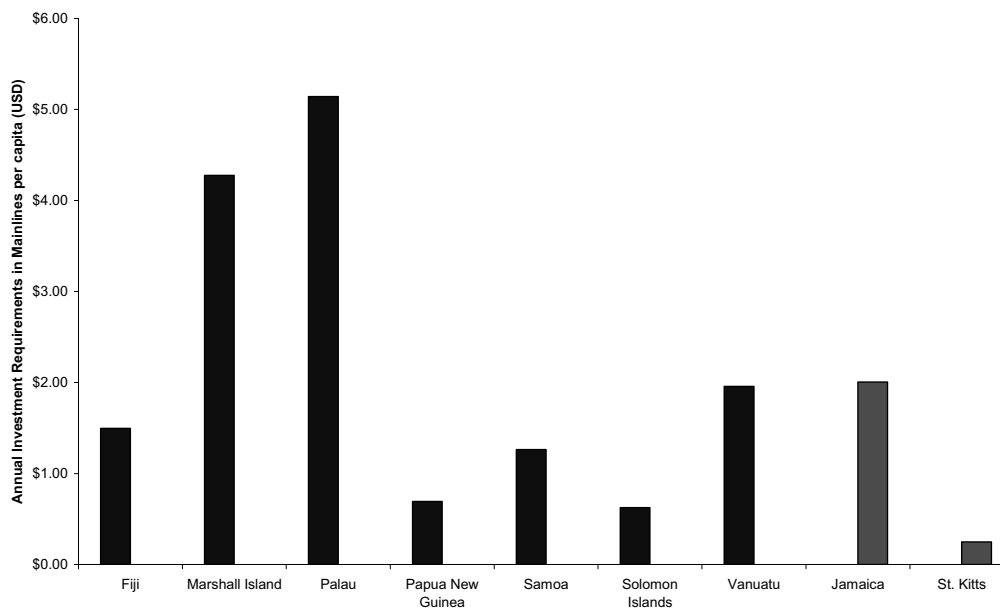
*Source: ITU Data, World Development Indicators*

We calculated the current number of lines (both mainlines and mobile) per person by dividing the number of connections in operation (2002) by the total population (2002). We then multiplied each country's projected population for 2015 by the target lines per person. Finally, we multiplied the total number of additional lines required by the average cost of a new line: US\$400 for mainlines, \$580 for mobile<sup>23</sup>. We then derive the annual per capita investment requirement from this total figure.

<sup>23</sup> The cost per mainline and cost per cellular phone subscriber were taken from the unit costs for infrastructure investment quoted in World Bank Policy Research Working Paper 3102: "Investing in Infrastructure: What is needed from 2000 to 2010", M. Fay and T Yepes, July 2003, pg 10

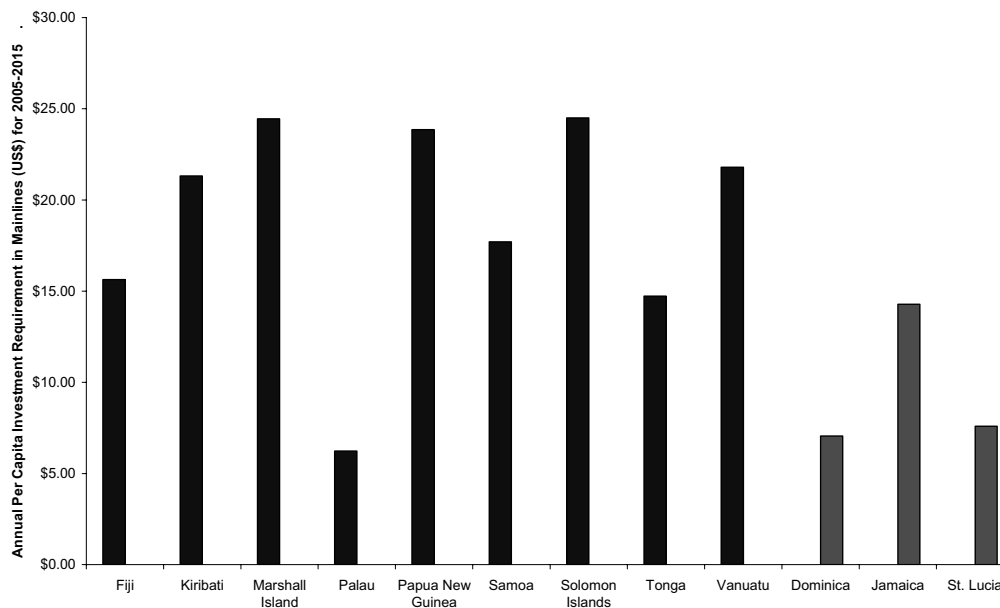


**Figure 8.6: Annual Per Capita Investment Requirements in Mainlines to reach the Minimum Target**



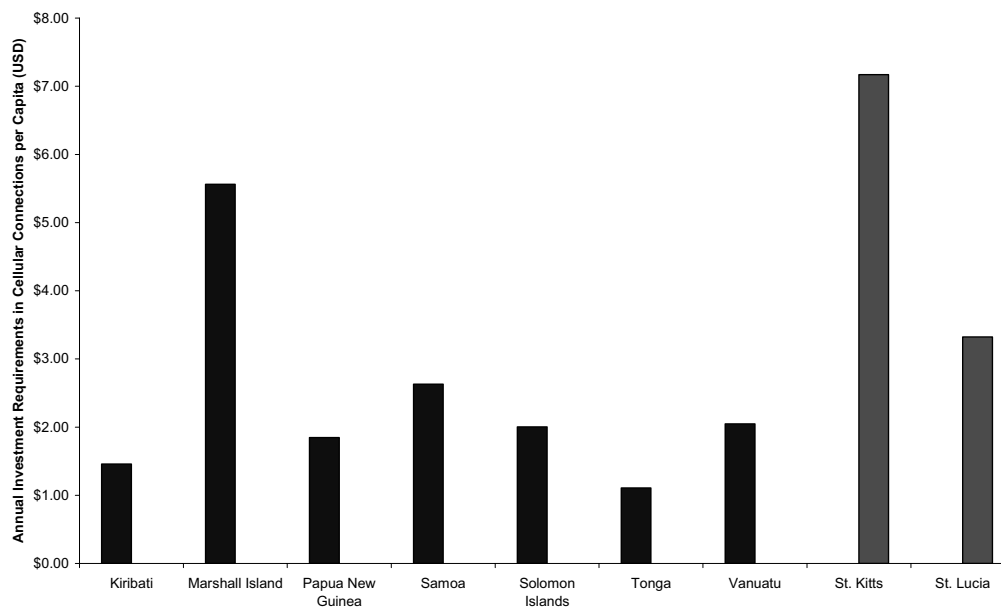
Source: Castalia Research

**Figure 8.7: Annual Per Capita Investment Requirements in Mainlines to reach the Maximum Target**



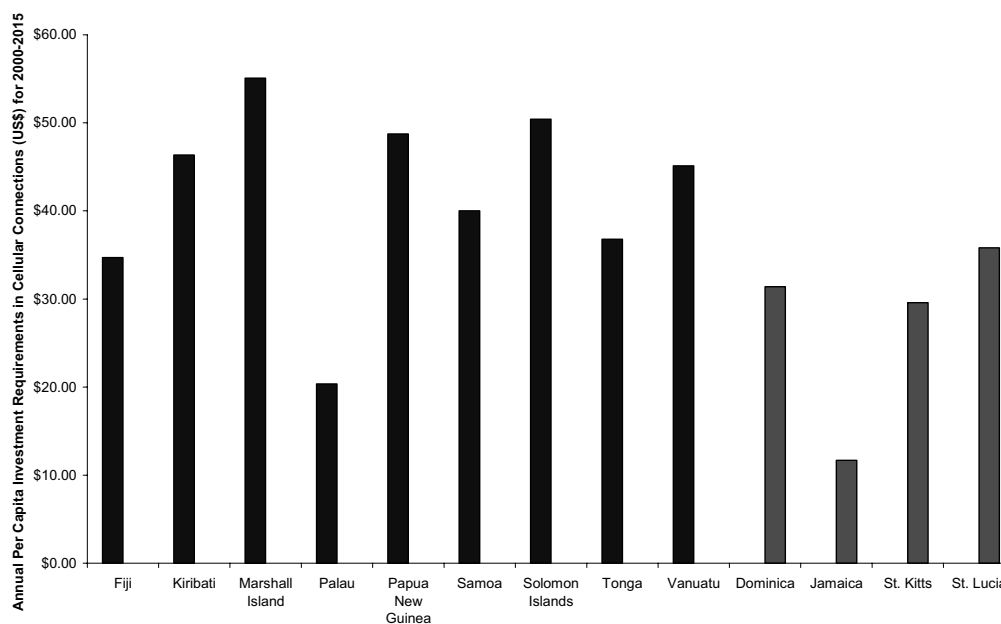
Source: Castalia Research

**Figure 8.8: Annual Per Capita Investment Requirements for Mobile Connections to reach the Minimum Target**



Source: Castalia Research

**Figure 8.9: Annual Per Capita Investment Requirements for Mobile Connections to reach the Maximum Target**



Source: Castalia

For the minimum target, Kiribati and Tonga do not have any specific mainline goals to reach by 2015, as they already meet the requirements. The same goes for Fiji and Palau for mobile connections.

We use the minimal telecommunications targets for our estimate of the total investment requirement. We would emphasize that this is a conservative approach, and higher levels of investment in telecommunications are likely to be both commercially and economically justified.

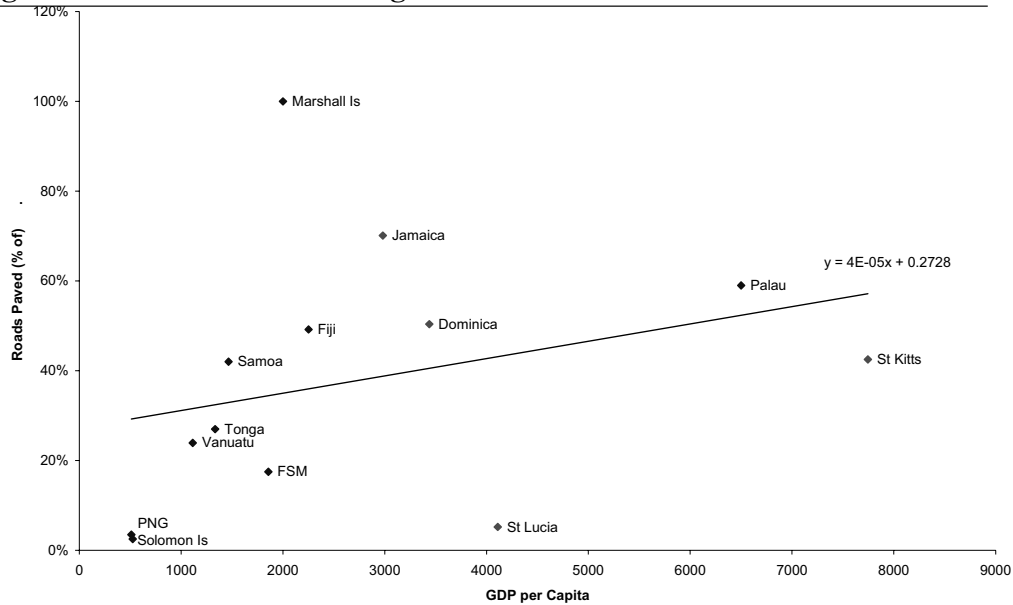
## 8.4 Roads

With respect to roads, there is again no universally agreed, unambiguous target. For our analysis here we assume that all necessary basic roads are already in place, but that additional welfare gains would come from sealing currently unsealed roads, thus increasing their reliability and load carrying capacity. We estimate the trend relationship between the proportion of roads which are paved and per capita GDP. This is shown in the figure below.

As in the case of telecommunications, we define the target in terms of reaching the trend in the relationship between the proportion of paved roads and per capita GDP. We then convert the target proportion into kilometers of roads that require sealing.

The unit cost of sealing a road is estimated at US\$4.7 per square meter. Assuming average width of 3 meters, this translates into \$US14,100 per Km<sup>24</sup>.

**Figure 8.10: Roads Benchmarking**

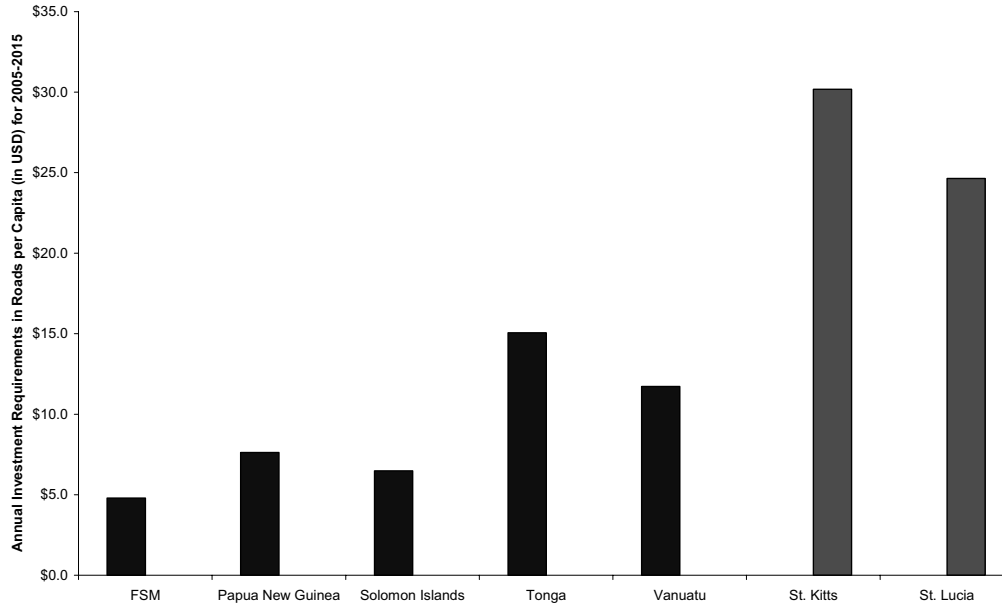


Source: WDI Indicators

Fiji, Marshall Island, Palau and Samoa appear above the trend line, and so already reach the required standards.

<sup>24</sup> The cost is based on the average cost given by Transit NZ in its “Elemental Cost Database” issued in March 2005, of NZD34. It includes different types of sealing processes.

**Figure 8.11: Total Annual Per Capita Investment Need for Roads, in USD**

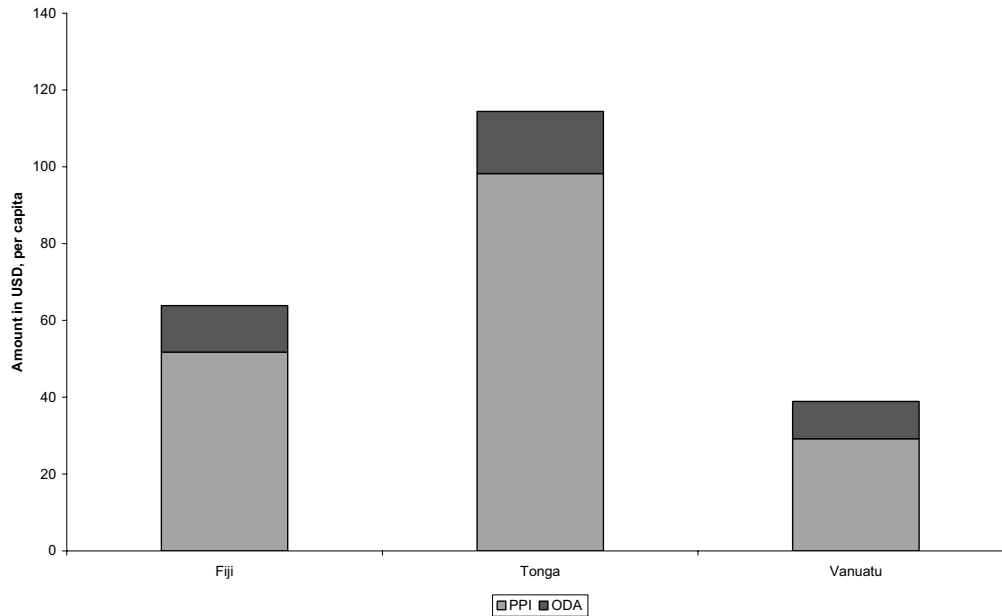


Source: Castalia

## 8.5 Sources of Funds

We have been able to obtain only limited data on recent flows of ODA funds and private investments into the infrastructure sectors. Figure 8.12 presents data from 2003 for the ODA and the most recent years for PPI (here 2004 and 2002) for three Pacific countries.

**Figure 8.12: Annual investment in Infrastructure from ODA and PPI per Capita**



Source: ODA Data from OECD Database, PPI data from World Bank PPI database

Fiji represents a useful test case. Our sector-by-sector analysis indicates that Fiji is likely to require approximately \$100 per person per annum for investment into various infrastructure sectors. The data from the World Bank databases indicates

that Fiji is currently able to attract approximately \$60 per person per annum in private and ODA funds into these sectors. Hence, there is approximately a 40 percent gap between the amounts needed and the funds available. We note that the bulk of investment already comes in the form of private participation in infrastructure.

Considerable effort will be required to mobilize both official and private sources of funds. However, the example of Tonga, which has been able to attract US\$100 per capita in PPI funding, shows that it is possible to do so.

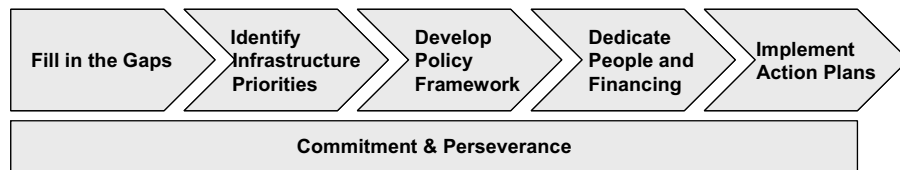
## 9 How do we meet the Challenge?

This document discusses infrastructure performance in the Pacific. Most Pacific countries face a unique set of challenges to good infrastructure performance. They demonstrate different levels of infrastructure performance, have different development priorities, and face varying challenges to good coordination and accountability. But, some countries that face similar challenges demonstrate better performance than others. This suggests that better performance is possible, with better institutions, management and policy design. Nevertheless, there will not be a ‘one size fits all’ solution to infrastructure challenges in the Pacific.

This discussion analyzes sector performance using publicly available data and information. Some of this is outdated. In addition, the scope of this study did not allow for extensive or in-depth interviews with Pacific country leaders and policy makers. It is therefore inevitable that there are gaps in this analysis, therefore we are not in a position to recommend solutions. This discussion paper is aimed at encouraging debate. It provides a preliminary analysis of infrastructure performance in Pacific countries, and a view on things that could be done to lift performance.

Figure 9.1 illustrates an approach to meeting the infrastructure challenge in the Pacific.

**Figure 9.1: An Approach to Meeting the Challenge**



*Source: Castalia*

The first step is to ‘fill in the gaps’, and to verify the data presented, and to test whether the analysis rings true for Pacific country leaders.

Leaders and policy makers must then decide how big a priority infrastructure is for their country. They must also determine the infrastructure priorities, as not all sectors will require the same level of investment or focus.

Having identified the priorities, it will be necessary to put in place a policy framework that will enable and support the reform initiatives selected. People and finance must be dedicated to projects and program implementation.

This process will take time. It will also take commitment and perseverance.

In this section, we propose a set of discussion topics for debate, to initiate the first step of ‘filling in the gaps’. Each topic is presented in a separate box below, together with a summary of the views presented in this paper.

Box 9.1: Will benchmarking help provide a better picture of infrastructure performance?

It is difficult to determine how effectively or efficiently infrastructure is performing without making comparisons with systems in similar countries.

We have suggested that benchmarking initiatives in the electricity and water sectors should be maintained and strengthened through publicizing the results and continuing to develop utilities' capability to gather and measure data, and utility managers' ability to use and act upon the benchmarking information to improve performance.

Although each country's specific circumstances will be unique, introducing performance benchmarking to other infrastructure sectors will help to improve performance and will encourage better coordination and accountability. Benchmarking will also help to identify areas of infrastructure underperformance, given the specific constraints faced by each country.

A regional benchmarking unit, responsible for overseeing and assisting data gathering, measurement and analysis for all sectors and all countries would help to overcome capacity and capability constraints.

Box 9.2: What public sector reforms will benefit Pacific countries?

How much more efficient can the existing public sector providers become with appropriate reforms? Experience elsewhere shows the outcomes for infrastructure investment are significantly better when public sector entities operate commercially, and at arms length from day-to-day political interference. How realistic is this objective given the makeup of political and governance structures in the region?

If public sector reforms are to be successful, it is important that infrastructure operators are able to recover their full and reasonable costs of operation. If this is politically unacceptable, for example in countries with low income levels, subsidies should be made explicit.

Skilled, capable management is necessary for successful reforms. Countries with small pools of human resources should consider appointing individuals from outside the country. Offering higher salaries may help to attract the right people, and may be worth the extra expense if the individual is able to turn performance around.

Staff redundancies may be necessary to improve efficiency and to provide incentives for good performance. Governments can encourage the development of small businesses to compete for the provision of non-core services. Where this is not politically feasible, staff may be re-deployed at a minimum wage to perform other value added activities. These staff should not be replaced once they leave or retire.

Implementing public sector reforms may only be possible over the medium term. However, actively recruiting skilled management, (if existing managers are deficient), is a short term priority, as it is important that senior managers have input to the reform planning process.

Box 9.3: Can private sector involvement be encouraged?

Private sector involvement in infrastructure has helped to improve performance in many countries, but the rate of success is very sensitive to the policy environment private sector operators can work.

The greater the uncertainty they face from opaque rules, from arbitrary or inconsistent regulatory frameworks where monopoly or dominant operator conditions exist, or from the lack of an independent, competent and timely Court system is available to resolve disputes, will simply discourage PSP.

Inevitably the greater the scale of the problems PSPs face, the higher will be the risk premium for uncertainty. This is a real cost to consumers in the form of higher prices, or to taxpayers where subsidies are involved.

On the other hand, awarding contracts for private sector service provision can help to overcome technical and management skills and capacity constraints. It can also provide much needed capital investment for countries which invariably face problems in attracting risk capital.

In very small Pacific countries, or for extending infrastructure service to rural or remote areas of larger countries, it may not be possible to attract private providers without offering a subsidy. In these situations, governments could introduce competitive bidding to select operators willing to provide services for the lowest subsidy. If subsidies are required, they should be made explicit. The question is how far are governments prepared to go to expose the true cost of providing infrastructure for poverty reduction and allocating ongoing subsidies in the annual Budget?

Larger countries may be able to attract private investment for some services (e.g. airport terminal services, port services or electricity generation). In smaller countries, this may not be possible, as the small scale and geographical isolation would not attract interest in a world where there are greater opportunities for less risky investment elsewhere.

These countries could try to contract all services to a single operator on a long term basis to improve efficiency. This may work in smaller ports or airports, or for road maintenance in small countries.

Private sector contracts should be carefully designed to ensure they provide incentives for the operator to address the specific sector issues, and specifying appropriate monitoring mechanisms to ensure service prices and quality expectations are met.



Box 9.4: How extensive are the opportunities for competition in the Pacific region?

There appear to be opportunities for competition in mobile and international telephony and in internet service provision for example. Competition can help to lower costs and improve service in countries that are large enough to support two or more competing operators.

Countries like Fiji, Samoa, Vanuatu, Solomon Islands, Tonga or Papua New Guinea can and do have competitive operators. However it has to be said that the rules for the players are sometimes skewed in favor of the incumbent – often government owned – operator. In the end, a PSP will not commit the investment in new services or maintain existing services of the playing field is not level.

Competition in air services may help to encourage more choice and lower airfares, but the potential is sensitive to the environment within the country seeking the air services. For example, are landing fees and airport facilities adequate and fairly priced?

Where governments are concerned about continuity of service (particularly in smaller, more remote countries), competitively bid contracts under which airlines promise to service specified routes at specified frequencies in return for an agreed subsidy, may be more effective and efficient than financing a loss making national carrier.

Competitive environments can be simulated in natural monopoly sectors, such as water and electricity distribution, by inviting private operators to bid for contracts to provide service for a fixed term.

Box 9.5: How good are the oversight mechanisms in Pacific countries?

In essence, most countries in the region have a lot to do to install open, transparent and independent oversight mechanisms to ensure accountability. Sector reforms will help to achieve separation between the service provider and the governing authority, but this needs to be accompanied by open reporting to and oversight processes by independent regulatory bodies or to Parliament where the government is the service provider and implicit regulator.

Independent Boards with the responsibility to report openly, can oversee management activities in public corporations or corporatized entities.

Where the private sector faces competition and consumers of infrastructure services have real choice, it should not be necessary to have a specific sector regulator beyond an anti-competitive agency to monitor and prosecute predatory behavior. In small countries with human capacity and skills issues in being able to provide these overview functions, there is a strong case for establishing region wide overview capability. This is an issue which the Pacific Forum could explore in depth across the sensitive infrastructure sectors like water, electricity communications and international transport services.

Publicized performance benchmarking will help to encourage some accountability, as will strong community involvement. Donors and multilateral lending agencies can also help to encourage increased accountability.

Box 9.6: How can the public sector be strengthened to deal with barriers to good infrastructure performance?

This is a critical issue for most countries, especially with respect to obtaining skilled human capacity that will remain in country. Dealing with this issue will be critical to obtaining infrastructure improvements in all Pacific countries, regardless of the reform policies selected.

Successful private sector involvement and competition will require the development of public sector capability to manage these arrangements, in addition to good contract design. Capacity building is necessary to clearly define institutional boundaries, and to ensure trade-offs between different interests and objectives are well understood and transparent.

Public sector strengthening is also necessary for effective oversight through regulation or other institutional arrangements.

Box 9.7: How will the reforms and improvements be financed?

Improving access to and the quality of infrastructure in the Pacific will require considerable investment. Most Pacific countries will require considerable increases in their total levels of investment to combine improvements in infrastructure with growth in other sectors of the economy.

Some Pacific countries have relied heavily on aid to fund major infrastructure projects in the past. Meeting future investment requirements will require a change to fiscal priorities, improved functioning of the financial sectors and mobilizing private savings – both domestic and international.

# Appendix A: Infrastructure Sector Analysis

## A.1 Telecommunications Sector Analysis

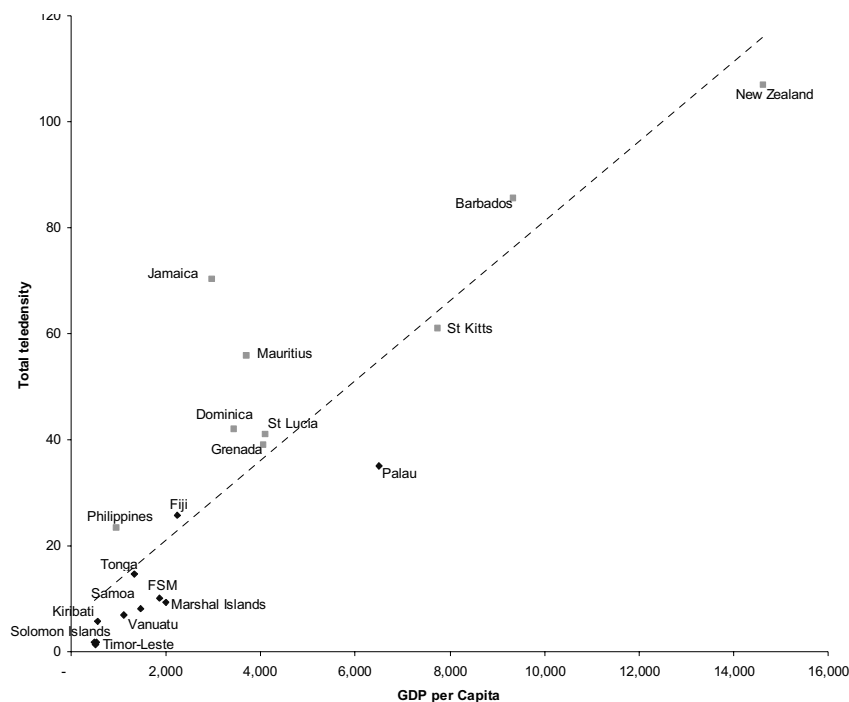
This section reviews the performance of each of the Pacific countries and outlines possible reasons for relatively good or relatively poor performance. It discusses the extent to which performance of telecommunications services can be explained by economies of scale. Services reviewed include local and international voice telephony, mobile and internet services.

### Access

Teledensity (defined as telephone lines per 100 people) is a key indicator of access to telecommunications services. Figure A.2 compares the total teledensity (fixed and mobile connections) of the Pacific and comparator countries. Figure A.3 illustrates a breakdown of teledensity by mobile and fixed line components.

Total teledensity is low in most Pacific countries. Of the countries reviewed, only Fiji and Palau have over twenty connections per 100 people. Access levels are also low when compared with GDP per capita. None of the Pacific countries reach the Philippines level of access, for example, even though their income levels are similar. Among the Pacific countries, only Fiji and Tonga have teledensity levels that correspond with their GDP per capita according to this trend line.

**Figure A.1: Total Teledensity vs GDP per Capita**



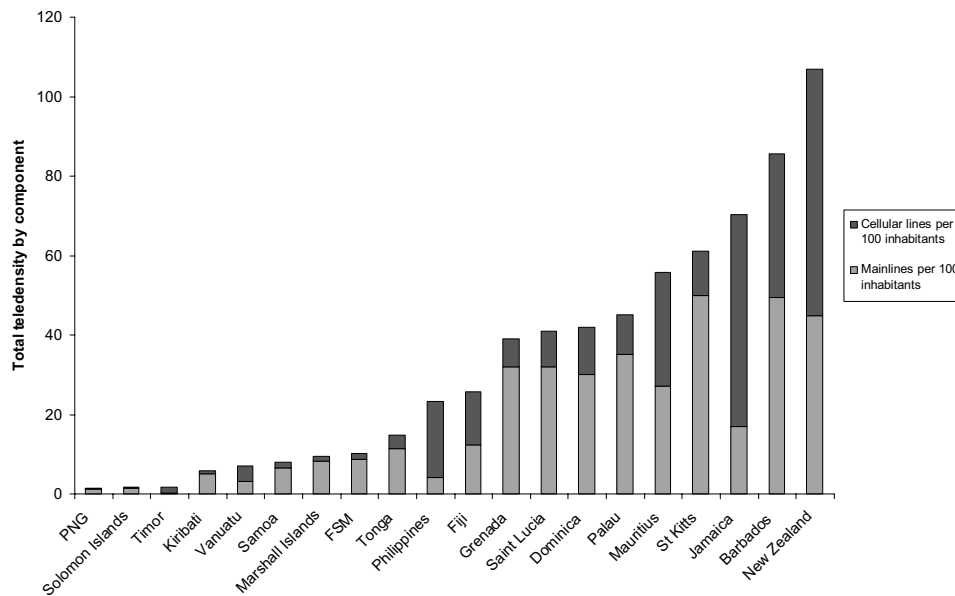
Source: ITU Data 2002 (Fiji, Marshall Islands and Vanuatu data 2003), Timor-Leste teledensity from Commonwealth Telecommunications Organization, 2004

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

The proportion of mainline access as a component of total teledensity is relatively high in the Pacific countries when compared with comparator countries. Fixed line telephony accounts for over 80% of total teledensity for Federated States of Micronesia, Kiribati, Marshall Islands, Palau, Papua New Guinea, Samoa and the Solomon Islands. Tonga follows closely with 77%. Most comparator countries, as well as Fiji and Vanuatu, have almost equal levels of fixed and mobile telephony. Mobile telephony was introduced late to the Pacific, often by the incumbent operator using old technology<sup>25</sup>.

The dominance of fixed lines in most Pacific countries is similar to the situation in Caribbean countries prior to telecommunications liberalization. In 1998 mainlines accounted for over 80% of total teledensity levels for almost all Caribbean countries<sup>26</sup>. In 2002, after the introduction of competition in mobile telecommunications, half of these countries had mobile access roughly equivalent to that of mainlines. In Belize, Dominican Republic and Jamaica, the mobile teledensity level was significantly higher than mainline.

**Figure A.2: Total Teledensity by Country**



Source: ITU Data 2002 (Fiji, Marshall Islands and Vanuatu data 2003), Timor-Leste teledensity from Commonwealth Telecommunications Organization, 2004

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Telephone access is largely limited to urban areas in the Pacific countries. In Kiribati, Marshall Islands, and Papua New Guinea between 85% and 100% of main lines are in urban areas, and urban mainlines account for 70% and 72% in Micronesia and Samoa respectively. This can be explained in part by the challenge of deploying a telecommunications network across mountainous terrain or dispersed atolls, for example, Kiribati's land area is roughly equivalent to St Lucia's, but it is spread over an area the size of Western Europe<sup>27</sup>.

<sup>25</sup> For example, AMPS is often employed instead of GSM

<sup>26</sup> Antigua, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, St Kitts, St Lucia, St Vincent, Suriname, Trinidad & Tobago

<sup>27</sup> "Swimming Against the Tide: An Assessment of the Private Sector in the Pacific" ADB, 2004

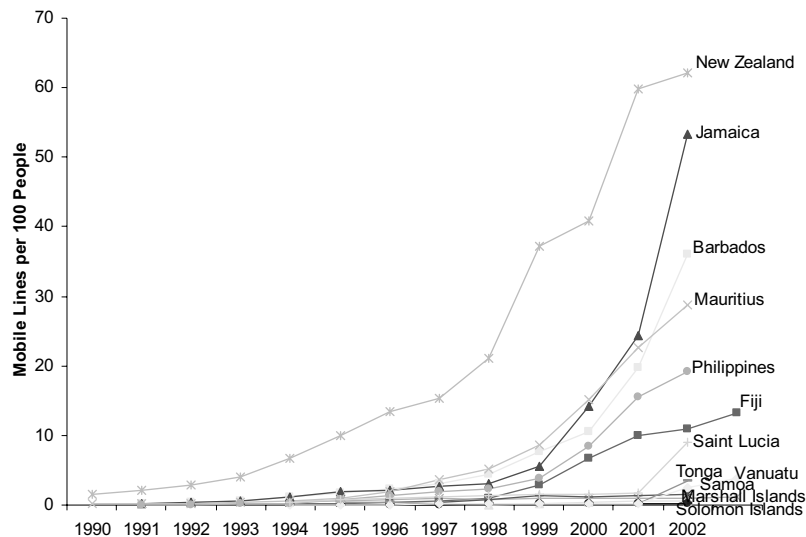
Box A.1: Increased Mobile Penetration in St Lucia

By December 2003, following mobile market liberalization, 60% of St Lucian households had a mobile telephone, an increase of 40% on 2002 levels<sup>28</sup>. This is partly due to the low cost of prepaid mobile compared with the minimum outlay for monthly fixed line telephone access. Mobile competition in St Lucia has also improved Universal Access levels, leading to over 90% of the population being covered by cellular signal.

Source: “St Lucia Case Study” ITU, June 2004

Mobile telephony in Pacific countries has grown over the past few years, and is increasingly treated as a substitute for fixed line services, but growth in mobile uptake significantly lags most of the comparator countries. Figure A.3 shows the pattern of mobile growth in Pacific and comparator countries.

Figure A.3: Growth in Mainline and Mobile Teledensity (1990 – 2002)



Source: ITU

Countries without GSM networks and pre-paid services (such as Kiribati and Samoa) have lower mobile teledensity than countries like Fiji and Tonga. Tonga’s mobile penetration levels have increased significantly since competition has been introduced. Box A.2 presents a description of competition in Tonga’s telecommunications sector.

<sup>28</sup> “St Lucia Case Study” ITU, June 2004

Box A.2: Introducing Telecommunications Sector Competition in Tonga

Local and international telecommunications services are provided by Tonga Communications Corporation (TCC). It also operates the ISP KaliaNet and a GSM network U-Call Mobile, which launched in 1991. Shoreline Communications (TonFon) was awarded a license to provide mobile services and launched a GSM service in August 2002, providing mobile coverage across Tonga's main islands.

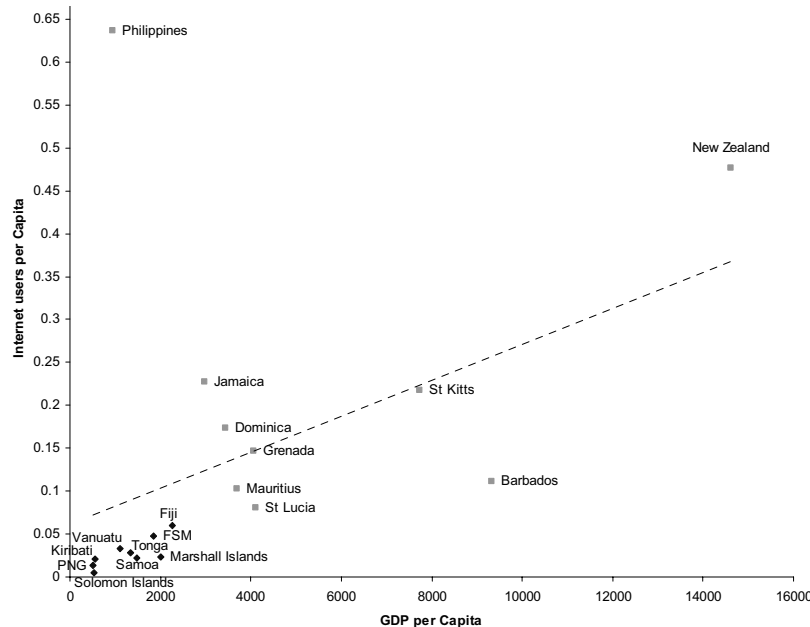
Within a year of introducing competition for mobile services, the tariff for almost all services dropped by more than 20% and the numbers of mobile subscribers and internet users both doubled. The result of competition has been that "telephones are easier to get, cheaper to buy and communication is faster". It has also resulted in the two competing companies upgrading their infrastructures for further use in communications and broadcasting.

In a speech in Geneva earlier this year, the Tongan Prime Minister emphasized that the country's vision for ICT is driven both by local market parameters, recognition that the information economy transcends national borders and interests. Expanded connectivity in Tonga will help to stimulate domestic growth and greater participation in an international economy. This recognition has been an important driver of telecommunications market liberalization in Tonga.

Source: Commonwealth Broadcasting Association Conference 2004, Nadi, Fiji. <http://www.cba.org.uk/fiji18.htm>

Figure A.4 illustrates the level of internet use in Pacific countries compared with countries with similar levels of GDP per capita. The level of internet use in Pacific countries is low relative to other parts of the world. In fact internet access has only recently become available to most of these countries. It was first introduced to Fiji in 1995 and to some other Pacific countries as recently as 2000<sup>29</sup>.

Figure A.4: Internet Users per capita vs. GDP per capita



Source: Castalia

<sup>29</sup> Internet access was introduced to Tuvalu in 2000. "Pacific Islands Regional Input Paper", 2003, Pacific Islands Forum Secretariat (Asian Regional Conference for the World Summit on the Information Society)

Low mainline access levels help to explain the low internet uptake. For example, in the Solomon Islands, internet is only available to the seven main urban centers that have telephones. This accounts for less than 25% of the total population. Another constraint is the high cost of international connectivity<sup>30</sup>.

Approximately a quarter of Pacific Islanders have access to internet through work, educational institutions and some public centers. All countries are served by monopoly Internet Service providers (ISPs) except Papua New Guinea, Samoa and Tonga, where there is competition between ISPs. Almost all internet users are located in capital cities. The Philippines represents the most significant departure from the trend line. Despite a relatively low level of GDP per capita, this country has managed to attain high internet penetration. This is described in Box A.3.

**Box A.3: Telecommunications and Internet Access in the Philippines**

**The current Philippine telecommunications market is one of the most competitive in the world with five companies providing mobile services, eleven international gateway providers and at least two operators that are allowed to provide fixed service in each region throughout the country. Mobiles are ubiquitous in the Philippines, which was one of the first countries to see mobiles surpass fixed line penetration levels.**

**The Philippines is one of the few countries in the world where telecommunications services have been historically operated by private entities. Innovative regulatory requirements implemented in the mid-1990s called for mobile and international telecommunications operators to install a specific number of fixed lines. This was seen as a way of balancing the more lucrative opportunities in these markets against the less profitable requirements to roll out lines outside of the most densely populated centers.**

**Each cellular operator was required to install 400,000 lines and reach 300,000 international operator lines within five years. These operators were assigned different regions of the country to ensure an even roll-out and had targets for the ratio of urban to rural lines installed to ensure that lines were not only installed in cities. Cross subsidies were allowed (e.g. from mobile or international operations) in order to ensure local rates stayed affordable and local exchange operators received access fees for use of their networks. Operators were required to put up performance bonds that could be forfeited if line installation targets were not met.**

**The total number of lines called for under this initiative was eventually met, but many are not in service. At its inception, the popularity of mobile telephony had not been anticipated. In addition, many lines were installed in places where people couldn't afford or did not want fixed line services. The high line rate of line installation therefore didn't result in the biggest gain in service or penetration rate, but this did have a big impact on opening up the market and encouraging growth.**

**There is no official figure for the total number of ISPs operating in the Philippines. The National Telecommunications Commission (NTC) has registered over 150 Value-Added Service (VAS) providers, but not all of these are ISPs and not all ISPs have registered with NTC. VAS providers must lease their transmission infrastructure from licensed telecommunications operators. Public telecommunication operators and almost all international telecom operators lease international internet bandwidth to downstream ISPs, which in turn often resell connectivity to smaller provincial ISPs.**

**Because local calling is free in the Philippines, dial-up internet subscribers only pay the ISP charge. However, the relatively high monthly charges for land line ownership reduce the potential size of the dial up market. Because of this, pre-paid internet access has grown in popularity as pre-paid cards do not require the user to have a telephone line and they can be used at internet cafes. This has contributed to the high estimated levels of internet penetration in the country.**

**Source: "Philippines Case Study" ITU, March 2002**

<sup>30</sup> "Infrastructure in East Asia and the Pacific – The Way Forward" Telecommunications Case Studies, John Ure, July 2004

### *Universal Access*

Universal access refers to the goal of putting working, affordable, telephone or mobile services and internet access within the reach of the whole population. Universal access is an important goal for Pacific countries seeking to overcome the constraints of remoteness and distance between islands. The Pacific Islands Forum Secretariat Communication Policy Meeting in April 2002 identified universal access priorities in: tele-health, distance learning and community telecentres and policy and regulatory frameworks.

In the telecommunications sector, the concept of universal service refers to the policy of making telephone service available to all homes, regardless of the distance from the switch or ability to pay. In most countries, universal service targets and policies have been adopted, based on the idea that telecommunications is an essential service that contributes to development.

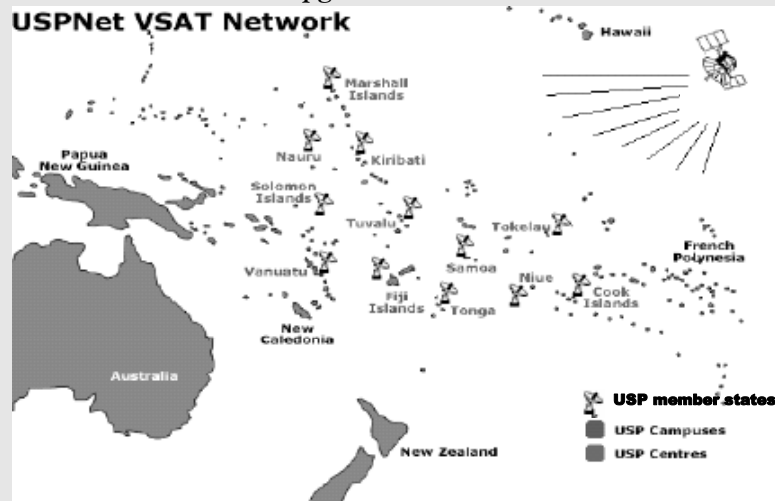
A 'telephone in every home' may be a realistic target for developed countries, but this is not the case in developing countries. Because of this, the term 'universal access' was established to refer to a more realistic goal of putting a working, affordable telephone within reach of the whole population of a country. In addition, the term has been expanded to include mobile communications and increasingly, internet access under the banner of Information and Communications Technologies (ICTs). This reflects the increasing importance of information technology in developing commercial, social services, healthcare and education sectors. The concept of universal access has become an increasingly important objective for telecommunications policy and legislation in developing countries. In the Pacific universal service policies refer to universal provision of voice telephony, public pay phones and internet access, corresponding with our definition of universal access, which we discuss in this section.

In most countries around the world, monopoly operators have been traditionally charged with the obligation to provide a certain number of new connections per year. This approach to expanding service generally relies on cross-subsidizing local charges and connection fees from international charges. It is called the 'Universal Service Obligation'. Incumbent telecommunications operators in the Pacific also have universal service obligations.



Box A.4: University of the South Pacific – Distance Learning through Satellite Communications

The University of the South Pacific (USP) is an example of a successful implementation of a region-wide distance learning scheme using a satellite telecommunications network. The University is owned by twelve South Pacific countries and has centers in 11 member states. Sixty percent of its students make use of the distance education program which is supported by a satellite communications network. USP has permission to bypass the international telecommunication providers and connect its 12 member states directly. Enrolment has increased by 72% in the past 2 years since this system was introduced. Nevertheless, internet bandwidth is still expensive over the satellite connection and this has forced the university to restrict internet access among students. It is currently investigating opportunities to expand the IP platform in order to take better advantage of the internet. The technology and satellite are set to change later this year and there are plans to introduce a new high speed link to Canberra and an upgrade to IP based connections by the end of this year. Not all countries have actually licensed USP. Some just agree to it informally. This is problematic when the links are upgraded.



Source: "Fiji Case Study" ITU, June 2004

In Samoa, mobile technology has been effective in helping the incumbent operator, SamoaTel, meet its universal service obligation. SamoaTel may not provide mobile services, (an exclusive license has been awarded to Telecom Samoa Cellular), but the company has used GSM technology to create wireless local loop networks in remote villages. People are able to use wireless handsets to make calls from within the village, but the handsets will not work outside of the village. Although the use of this technology is currently being disputed by Telecom Samoa Cellular, which believes this to be a contravention of its exclusive license, it has proved to be a cost effective way of extending basic services to these communities.

In a liberalized telecommunications market, the traditional method of financing the universal service obligation is not possible. There is not much liberalization experience to draw on in the Pacific, but our comparator countries provide some examples of alternative approaches to providing universal access:

- **A levy on interconnection fees:** In some countries, despite a move to liberalization, the incumbent operator has retained an obligation to extend telecommunications coverage which is funded through a levy implicit in the interconnection charges. This is sometimes called a *Telecommunications Service Obligation* (TSO) policy. New Zealand's 'Kiwi Share' obligation is a

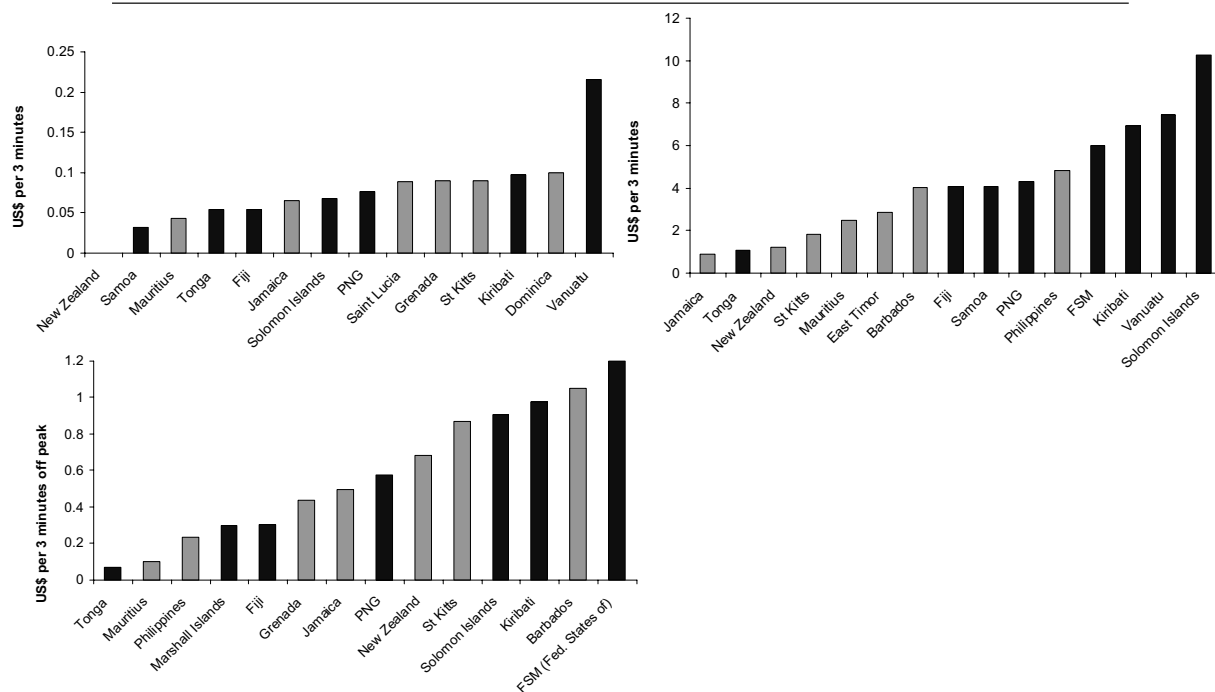
good example of this. The Kiwi Share is a contractual agreement requiring Telecom New Zealand (New Zealand’s incumbent operator) to make ordinary residential telephone service widely available, charge no more than the standard rate for ordinary residential telephone service and maintain free local calls for ordinary residential telephone service, fax and internet. All telecommunications service providers are required to contribute to the costs of the TSO through a premium on prices for interconnection with Telecom’s network. This is calculated and monitored by the Telecommunications Commissioner

- **Universal Service Funds:** These funds, also called Telecommunications Development Funds, have implemented service expansion through a reverse auction process in which the operator which demands the lowest subsidy to extend mainline, mobile or internet services into rural or sparsely populated areas wins a contract to do so. The subsidy is financed through direct Government contribution, radio license fees or a levy on all major operators. This method has been employed successfully in the Dominican Republic.

*Price*

Figure A.5 compares the costs for three minute local, international and off peak mobile calls in Pacific and comparator countries. These graphs show that many Pacific countries have relatively high international calling tariffs, but local and mobile calls rates are similar to comparator countries<sup>31</sup>.

**Figure A.5: Cost of a Three Minute Call: Local, International and Mobile (off peak)**



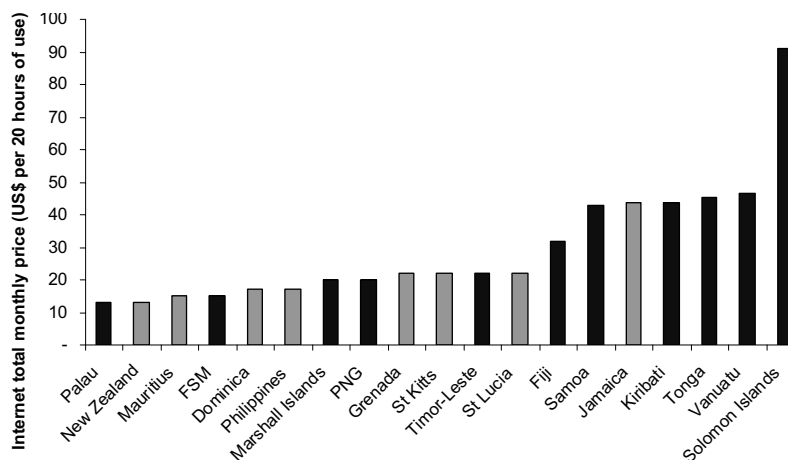
Source: ITU Data 2002

<sup>31</sup> Note: International calling rates in the Pacific are based on different zones. These are defined by distance and do not accurately reflect the cost to the operator. For example, in Samoa calls to the US are relatively expensive as the US falls into ‘Zone 4’, but it is relatively cheap for the operator to deliver traffic to the US. The cost is therefore disproportionate. When comparing local call costs, bear in mind that Vanuatu has a single rate for calling anywhere in the country, while in New Zealand residential local calls are free, and the cost is recovered in a monthly access charge.

In most Pacific countries, like Samoa, the relatively high price of international calling cross-subsidizes the roll out of telecommunications services to more remote areas within the country, and helps to keep local calls slightly below the level of comparator countries.

The international trend in mobile and international telephony has been that costs have fallen significantly with the introduction of competition. This has been the case in most Caribbean countries. Tonga is the only Pacific country with competition in the mobile sector. It also has the lowest mobile costs.

**Figure A.6: Internet Access Monthly Cost**



Source: WDI Indicators 2003, Castalia Research

Figure A.6 illustrates the monthly cost of internet access by comparing the typical cost of twenty hours of dial up access over the period of a month.

The costs for internet access in Pacific countries are typically higher than those found elsewhere. The Solomon Islands has the highest monthly cost which is one reason for its low internet penetration levels. Fiji, Samoa, Kiribati, Tonga and Vanuatu have higher internet costs than most comparator countries.

Despite their small market size Palau, Federated States of Micronesia and Marshall Islands have the lowest internet access charges. In Papua New Guinea, competition between ISPs has reduced internet tariffs. In Samoa, the introduction of competing ISPs resulted in a price reduction of 50% in the incumbent ISP and an increase in internet traffic of over 100%<sup>32</sup>.

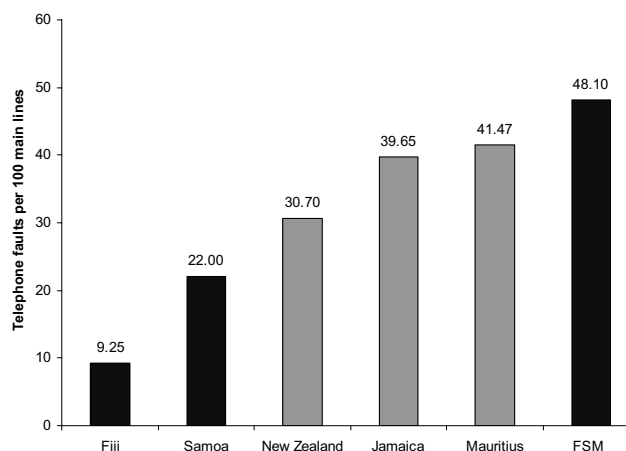
### *Quality*

Figure A.7 reviews the number of faults reported each year for each 100 fixed lines in service as an indicator of service quality.

Of the countries reviewed, the Solomon Islands and Fiji perform best with less than 10 faults reported per hundred mainlines. The Federated States of Micronesia performs less well with almost 50 faults per mainline reported. However, data on faults was unavailable for most Pacific countries and so this graph does not provide a complete picture.

<sup>32</sup> Castalia interview with Grant McGough, Acting CEO SamoaTel in September 2004

**Figure A.7: Reported Faults per 100 Mainlines**



Source: ITU Data – only data from 1998 onwards was used to compile this graph

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

**Box A.5: Quality of Telecommunications Service in Vanuatu**  
**Telecom Vanuatu Limited (TVL) monitors quality of service against agreed performance objectives on a regular basis. The table below provides an overview of TVL’s fixed network performance against some standard indicators:**

Indicator	TVL performance
<b>Waiting list for mainlines</b>	<b>188</b>
<b>Faults cleared within target time (3 days urban, 30 days rural)</b>	<b>76% for urban. Rural times are not known</b>
<b>% Calls that fail during peak time</b>	<b>0%</b>
<b>Telephone mainline faults</b>	<b>2560 faults:6500 main lines (April 2004)</b>
<b>% calls for operator service answered within target time</b>	<b>94% within 20 sec</b>

TVL’s fault repair time is longer than targets in other developing countries. Malaysia’s target is to repair 80% of faults within 24 hours and 90% within 48 hours. In India, the target is to repair 90% of faults by the next working day. TVL’s target for rural fault clearance is particularly long.

There are no failed calls on TVL’s network. This is because the network only has one switch that caters for fixed and mobile networks and has an abundance of spare capacity. This means that the network is seldom congested.

Source: “Infrastructure Regulatory Review for the Government of Vanuatu” Castalia and Network Strategies, July 2004

*Summary of Benchmarking*

The benchmarking exercise shows that on the whole Pacific countries have lower telecommunications access levels, and higher charges in international telephony and internet services than other small island countries with similar income levels.

**A.1.1 Institutional and Management Arrangements**

The provision of telecommunications services in the Pacific countries is characterized by monopoly organizations, limited private sector involvement and informal regulation mostly by Government Ministries. Table A.1 and Figure A.8 summarize the institutional arrangements in Pacific countries.

### *Competition*

Pacific countries – like most countries in the world – have a history of monopoly service provision. However, unlike the comparator countries, the region has been slow to introduce private sector involvement and competition.

Pacific countries have mainly government operated telecommunications providers. Competition is limited to the following countries and services:

- Tonga – in mobile services and internet service provision
- Papua New Guinea – in internet service provision
- Samoa – in internet service provision

In Samoa, Telecom Samoa Cellular has an exclusive license to provide mobile services. SamoaTel, the fixed line operator is employing GSM technology to provide ‘wireless local loop’ services to remote villages to meet their universal service obligations. This use of mobile technology is being contested by Telecom Samoa Cellular.

Where competition has been introduced, there appear to be benefits. The relatively low mobile tariffs in Tonga and the fall in internet charges in Samoa after the introduction of competing internet service providers indicate that these countries can benefit from liberalization. The population size and the level of GDP in both Samoa and Tonga is comparable to that of other Pacific countries.

Competition has not been introduced to international telecommunication services in any of the Pacific countries reviewed. The experience in the Caribbean countries was that market liberalization in this sector led to lower costs and improved service quality, although local rates had to rise as cross-subsidies were removed.

**Table A.1: Institutional Indicators in Pacific Telecommunications**

Institutional Arrangements	Fiji	FSM	Kiribati	Marshall Is. Palau	PNG	Samoa	Solomon Is.	Timor-Leste	Tonga	Vanuatu
Is there an independent telecommunications regulator (Y/N)	N	N	N	N	N	N	N	N	N	N
Is there private ownership of the incumbent operator (Y/N)	Y	N	N	Y	N	N	Y	Y**	Y	Y
Is the incumbent operator profitable (Y/N)	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Are there outsourced management arrangements for majority government companies (Y/N)	N	N	N	N	N	N	N	Y	N	N
Is there competition in local PSTN services (Full, Duopoly, Monopoly)	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Is there competition for mobile service provision (Full, Duopoly, Monopoly)	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Duopoly	Monopoly
Is there competition for international long distance calling (Full, Duopoly, Monopoly)	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly	Monopoly
Is there competition in Internet Service Providers (Full, Duopoly, Monopoly)	Monopoly	Monopoly	Monopoly	Monopoly	Full	Full	Full	Monopoly	Monopoly	Monopoly
Number of mobile providers in the country	1	1	1	1	1	1	1	1	1	1
Number of ISPs	1	1	1	1	5	3	1	1	1	1

Source: Castalia Research

\*\* Timor Telecom is operated under a 15 year Build Own Operate contract in which the Government has a 16.5% share

**Figure A.8: Institutional Arrangements in Pacific Telecommunications**

Private Operator	Domestic		International		Mobile		Internet	
	Private Company	% Government Ownership	Private Sector Ownership	% Government Ownership	Private Sector Ownership	% Government Ownership	Private Sector Ownership	
Marshall Isl: Marshall Islands Telecom Ltd	Fiji: FINTEL							
Samoa: SamoaTel	Fiji: Vodafone Fiji Ltd	51% (ATH)	49% (C&W)					
Solomon Isl: Solomon Telekom Company	Fiji: Vodafone Fiji Ltd	51% (TFL)	49% (Vodafone)					
Timor: Timor Telecom	Marshall Isl: Marshall Islands Telecom Ltd	25%	75% Marshall Isl Citizens					
Vanuatu: Telecom Vanuatu Ltd	Samoa: SamoaTel	40%	27.5% National Bank Provident Fund, 22.5% Bank of Samoa (both Gov owned entities), 10% Samoa Life Insurance					
Fiji: Telecom Fiji	Samoa: Telecom Samoa Cellular	10%	90% Telecom NZ					
Kiribati: Telecom Kiribati Ltd	Samoa: 3 ISPs operating		100% for 2 ISPs					
Kiribati: Telecom Services Kiribati Ltd	Solomon Isl: Solomon Telekom Company		51% SNPF, 41.9% C&W and 7.1% Investment Corporation of Solomon Islands					
PNG: Telkom PNG Ltd	Timor: Timor Telecom (BOT arrangement)	16.5%	50.1% Portugal Telecom, 16.5% local consortium, 10.9% Vodafone Macau					
Tonga: Tonga Communications Corporation	Tonga: Shoreline Communications		100%					
FSM: FSM Telecom Corporation	Vanuatu: Telecom Vanuatu Ltd	33%	33% C&W, 33% France Cable & Radio					
Palau: Palau National Communications Corporation								

### *Ownership Arrangements*

We observe the following ownerships arrangements in Pacific countries:

- Privatization and private sector involvement is being introduced gradually to telecommunications sectors for the provision of mobile and internet services. Most of the remaining service providers operate as commercial corporate entities
- Governments have retained control of the provision of basic telephony services
- Private participation is much less extensive than in the Pacific than it is in the better performing telecommunications markets of the Philippines and the Caribbean.

Incumbent operators have been corporatized in three of the Pacific countries. In Fiji, Telecom Fiji Limited is a government-owned limited liability company with an exclusive license to provide domestic telephony for a 25 year period (from 1989). Kiribati Telecommunications was divided into two companies: Telecom Kiribati Limited and Telecom Services Kiribati. Telecom Kiribati Limited is a fully government owned asset holding company that collects lease fees from Telecom Services Kiribati for Government funded facilities. Telecom Kiribati Limited also advises the government on regulatory matters. Telecom Services Kiribati (TSKL) is the national telecommunications service provider. It was established as a Joint Venture between the Government of Kiribati and Telstra, Australia in 1990. This Joint Venture agreement was terminated in May 2001<sup>33</sup> and TSKL has been operating under full ownership of the Government of the Republic of Kiribati ever since.

Cable and Wireless Pacific ended its involvement in Tonga in 2000. International and domestic telecommunications services were combined under the government-owned Tonga Communications Corporation (TCC). TCC is licensed as the only full range telecommunications service provider. It has a universal access commitment throughout Tonga

In Papua New Guinea Telikom PNG Ltd was established in January 1997 and given exclusive rights to provide all telecommunications and value added services. Mobile services are provided by Pacific Mobile Communications, a wholly owned subsidiary of Telikom PNG Ltd. Papua New Guinea is currently privatizing this state monopoly. Until two years ago, the preferred operator has been Fiji Telecom, but the government has recently switched to negotiating with Econet, an African-based group. Econet has paid for 51% of Telikom in a deal negotiated with the Independent Public Business Corporation, which now only requires formal cabinet approval for completion. The remaining 49% will stay in government control.

The deal requires Econet to introduce telephony services to 1400 villages throughout the country under a community service scheme that will be funded through tax credits. Econet expects to invest around AUD\$200 million<sup>34</sup> in Telikom. The deal is yet to be finalized. In September, questions were raised about Econet's financial viability and the entire deal has come under severe criticism from both the public and private sector in Papua New Guinea<sup>35</sup>,

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33 Anecdotal evidence suggests that Telstra terminated this Joint Venture due to low revenue generating capacity

34 "The African Connection" in Fiji Islands Business, August 2004

35 "More Twists and Turns in the PNG Telikom Sale" Fiji Islands Business, September 2004

and there have been calls to reconsider the Fiji Telecom offer once again. This remains a hotly debated issue.

The majority privately owned or controlled providers are:

- **Marshall Islands:** Citizens of the Marshall Islands own 75% of the incumbent operator, with individual shareholdings are limited to a maximum of 3%
- **Samoa:** Telecom Samoa Cellular is a joint venture between the Government of Samoa and Telecom New Zealand, which owns 90% of shares. Two competing private ISPs Samoanet and Lesamoanet operate off an internet backbone operated by Samoa Communications limited
- **Solomon Islands:** Solomon Telekom Company is a joint venture between the Solomon Island National Provident Fund, which holds 51% of the shares, Cable and Wireless with a 41.9% shareholding and the Investment Corporation of the Solomon Islands, which has 7.1% of the shares. Cable and Wireless has an exclusive operating license. The original 15 year license period was extended for another 15 years in 2003, and is up for review in 2008
- **Timor-Leste:** Almost all communications were destroyed in Timor in 1999. Public telecommunications services are being re-built under a 15 year Build Operate Transfer (BOT) arrangement with Timor Telecom and Portugal Telecom International awarded in 2001. In 2003 the Timor Telecom network provided nationwide voice and internet services covering Dili and twelve District capitals. Under this contract uniform tariffs apply across the country. The contract specifies that Timor Telecom must provide service at the same cost countrywide. Public and private institutions can build and operate their own networks based on satellite phones, but these may not be resold or offered publicly
- **Vanuatu:** The privatization arrangement in Vanuatu reflects the country's condominium past with the shareholding divided three ways between the government, France Cable and Radio and Cable and Wireless. The latter two take turns to provide the General Manager.

Cable and Wireless was the first international telecommunications company to pioneer privatization in the Pacific Islands Forum Secretariat countries when it entered into franchise agreements to provide international telecommunications services to the Cook Islands, Fiji, Solomon, Tonga and Vanuatu in the late 1970s. It continues to operate in Fiji, Solomon Islands and Vanuatu.

### *Regulatory*

Pacific telecommunications companies are regulated by the Telecommunications Ministry in most countries. Only three countries have established an independent regulator. PANGTEL in Papua New Guinea was established in 1996 and has responsibility for establishing performance and technical standards, approving guidelines for carriers and monitoring compliance with license conditions.

In Timor-Leste a legislative framework has been established and an independent regulatory body the Communications Regulatory Authority (ARCOM), created to regulate Timor Telecom. The BOT contract sets out the contractual conditions for the operator and tariffs are revisited regularly in negotiations between the regulator and operator. However, there is a need to strengthen the capacity of the regulator.



In Vanuatu regulatory powers are vested in the Minister for Telecommunications. The original Telecommunications Act introduced a regulatory authority, but this was subsequently repealed and the Minister assumed oversight of the sector. In Vanuatu, the concession is regulated informally. Lack of government capacity is one reason frequently cited for not establishing more robust regulatory capacity.

### **A.2.1 Policy Recommendations**

Monopoly arrangements inhibit growth in telecommunications in the Pacific. Small size and remoteness are two reasons commonly given for maintaining a monopoly. Pacific governments argue that very small markets will not attract investors and will therefore be unable to sustain competition, ultimately driving up costs for consumers.

Monopoly arrangements are generally profitable for the operators, but these profits do not necessarily translate into increased investment in infrastructure. For example, in Fiji, ATH's ratio of profits to revenues is 20%. Vodafone Fiji and FINTEL's (in which ATH is also a shareholder) are 42% and 35% respectively. The level of reinvestment of profits into telecom infrastructure in Fiji is low compared with other countries<sup>36</sup>. It records a capital expenditure to revenue ratio of 24%, lower than the small islands average of 28% and the recommended 40%.

The examples of St Lucia and Tonga's mobile sectors and ISPs in Samoa and Papua New Guinea show that despite small market size and a geographically dispersed population, most Pacific countries could sustain multiple services providers at least in these two sub-sectors, and that liberalization would help drive improved quality, better prices and increased access. We therefore recommend liberalization for countries like Fiji, Federated States of Micronesia, Solomon Islands and Vanuatu. These countries all have populations of 100,000 or more and are as big as or bigger than other countries where competition has been successfully introduced in mobile, internet and international service provision

Smaller states could benefit from regional competition in certain services. Countries with similar constraints (e.g. Micronesian countries have similar population sizes and geographical challenges), could collaborate to encourage private sector interest, by asking potential investors to bid to serve them as a group.

Competitive markets need to be supported by appropriate regulatory capacity. All Pacific countries have arrangements to regulate telecommunications prices. Additional capacity and institutional strengthening may be needed to oversee interconnect agreements and radiospectrum management. The Caribbean example of ECTEL (described in Box 7.9) demonstrates that there are benefits from regional regulatory cooperation.

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<sup>36</sup> Fiji Internet Case Study, ITU June 2004

## **A.2 Electricity Sector Analysis**

A stunning 70% or more of Pacific people lack electricity.<sup>37</sup> Those that do have electricity face high costs and unreliable supply. There are many reasons: poor management, poor maintenance and high system losses, but also inherent difficulties with small size, few economies of scale, and few indigenous, low cost renewable resources.

Most countries in the Pacific region suffer from having few primary energy sources from which to generate electricity. Typically in the Pacific, petroleum products account for some 80% of primary commercial energy consumption for transportation and energy. Just under half of this is used for diesel-fired electricity generation units<sup>38</sup>. Renewable energy, mostly mini-hydro, contributes less than 10% of commercial energy use.

Neither can many Pacific countries, because of their small size and separation by a large expanse of ocean which defines their geography, enjoy the benefit of economies of scale in electricity generation and distribution. In some areas, the widely dispersed populations, low population densities and the topography of their countries make rural electrification expensive and difficult to afford.

### **A.1.2 Benchmarking**

In this section, we examine the performance of Pacific and other similar countries. First, we present comparative information on access to electricity services. We then analyze the relative scale of operations across the region, and the performance indicators in each country.

#### *Access to Electricity*

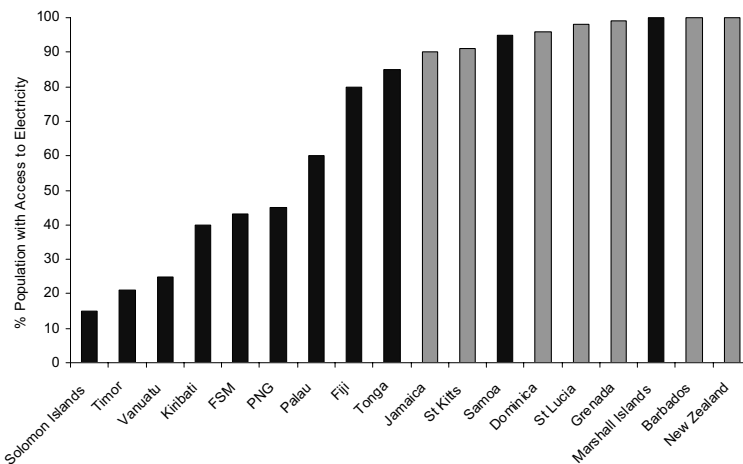
Figure A9 gives an overview of access to electricity in Pacific and comparator countries. Access levels in most Pacific countries are low when compared with other countries of a similar size and GDP per capita such as St Lucia, Dominica and Grenada.

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<sup>37</sup> ADB Technical Assistance *Report on Renewable Energy and Energy Efficiency Program for the Pacific*, April 2003 p1

<sup>38</sup> ADB Technical Assistance *Report on Renewable Energy and Energy Efficiency Program for the Pacific*, April 2003.

**Figure A.9: Access to Electricity**



Source: Castalia Research, SOPAC. Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

### Price

Electricity prices are driven primarily by four factors:<sup>39</sup>

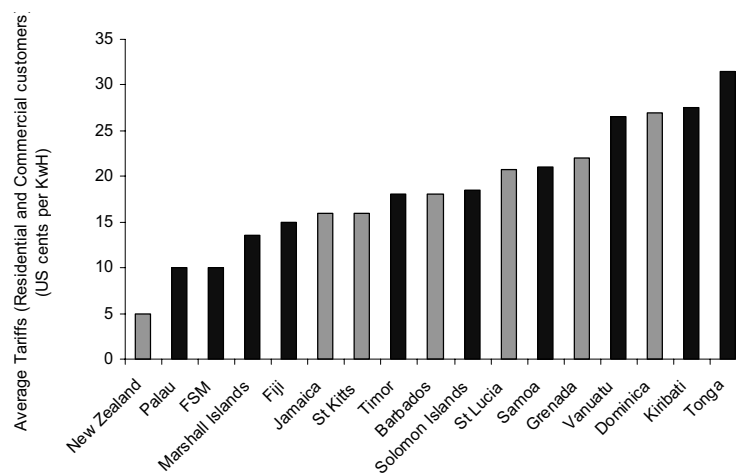
1. The cost of primary energy used to generate electricity. The highest cost tends to be imported fossil fuels. Countries with substantial hydro generation (such as Fiji) could be expected to have lower generation costs
2. The underlying costs of the generation, transmission and distribution assets which are influenced by geographical dispersal of the population, the particular technologies used, the age of the assets, and the efficiency with which they are operated
3. The efficiency of each of: primary energy supply, generation, transmission or distribution unit, and utilities' performance in minimizing system losses and maximizing the electricity delivered to consumers from each unit of primary energy input.
4. presents system losses
5. The extent to which government subsidizes electricity supply<sup>40</sup>.

Figure A10 below presents average electricity tariffs for the Pacific and comparator countries. Residential tariffs are often cross-subsidized by commercial tariffs. These data reflect the average tariffs across all customers.

<sup>39</sup> This section of the report uses prices as the basis for analysis rather than costs because reliable information about costs was very difficult to obtain. Prices do not necessarily reflect costs, but in absence of cost data, prices are the only reasonable proxy. Given the prevalence of subsidization of electricity considerable care in interpreting this data is needed.

<sup>40</sup> For example, FSM had access to considerable rural electrification programs from the United States

**Figure A.10: Average Electricity Tariffs**



Source: Castalia Source: Castalia Research, SOPAC

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Pacific retail electricity tariffs are evenly interspersed among Caribbean comparator countries. Lower tariff Pacific countries can be partly explained by government subsidization.

### Primary Energy Sources

In developing policy recommendations, it is important to start with an understanding of the extent to which high electricity costs are unavoidable, and the extent to which they could be lowered by adopting better policies. The type of primary energy available is a key determinant of cost which is not easily changed by better policies. Table A.2 below presents information on the primary energy sources for the generation of electricity.

**Table A.2: Source of Primary Energy for Electricity Generation**

	Dominica	FSM	Fiji	Grenada	Jamaica	Kiribati	Marshall Islands	New Zealand	Palau	PNG	Samoa	Solomon Islands	Timor- Leste	Tonga	Vanuatu
Hydro	45	3.7	53 <sup>41</sup>		2			63			37				0.5
Coal								4							
Oil	55	96.3	44	100	98	99	99.5		100	n.a.	63	100	100	99.5	99.5
Gas								26							
Other			3			1	0.5							0.5	

Source: Country supplied data, SOPAC and Castalia

### The Influence of Fuel Price on Electricity Prices

<sup>41</sup> Information is based on 2003 figures. In recent years the ratio of diesel to hydro generation has fluctuated widely – for example, from a low of 53% in 2003 to a high of 92 percent in 1994 reflecting the impact of drought years. Nevertheless, the trend has been for hydro to contribute a lower share as demand rises.

The predominance of oil fired electricity generation – mostly diesel – exposes the Pacific countries to the vagaries of the international oil market. Large variations exist between wholesale and retail prices of fuel in various Pacific countries. These go beyond the simple explanation of ‘small and remote markets’. For example: large volume markets in Papua New Guinea and New Caledonia have consistently reported up to 50% higher pre-tax wholesale prices than much smaller markets.

Analysis of the pre-tax wholesale price of fuel (mogas, diesel and kerosene) for three periods in 2003 showed that there is a substantial and systematic fuel price premium, above that charged by efficient fuel suppliers to a reasonably efficient small, remote market, being extracted from the Pacific region. The aggregate value of this premium is calculated as being in excess of US\$120 million annually.

In the Pacific:

- Up to 80% of the costs of island utilities can be attributed to fuel costs and outer island fuel costs can be 200 – 400% higher than that of main islands
- Exclusive ownership of fuel import terminals by multi-national oil companies (MNOCs) results in higher fuel prices, whether they operate as monopolies or not
- MNOCs use fuel terminal ownership and the resulting barrier to entry for new suppliers to extract high returns from Pacific countries. They therefore have no incentive to enter price competition with small islands
- Periodic international tendering of fuel supply (made possible by independent or government ownership of at least one import fuel terminal) is an effective form of competition between MNOCs

Fuel prices can be influenced by institutional arrangements. Data collected and reported bi-monthly over a period of 2 years demonstrated that the pre-tax wholesale price of fuel in countries such as Vanuatu and Kiribati (which have no price regulation and ‘closed market’ monopoly suppliers respectively) are consistently as much as 100% higher than those found in Samoa or the Solomon Islands, which have an open market international tendering process and price regulation.

Of the 11 Pacific countries reviewed, only Samoa has a national supply contract with a MNOC. It also has its own fuel terminal and can therefore change suppliers if it chooses. As such, Samoa has negotiated a favorable supply contract by sourcing the country’s total supply from one oil company. This benefit is reflected in diesel and petrol prices which are amongst the lowest in the Pacific region, before government taxes and levies are imposed. The Marshalls Energy Company owns its own fuel terminal and can therefore purchase fuel directly from MNOC suppliers. This contributes towards lower overall fuel prices. However, the Marshalls Energy Company does not supply fuel nationally.

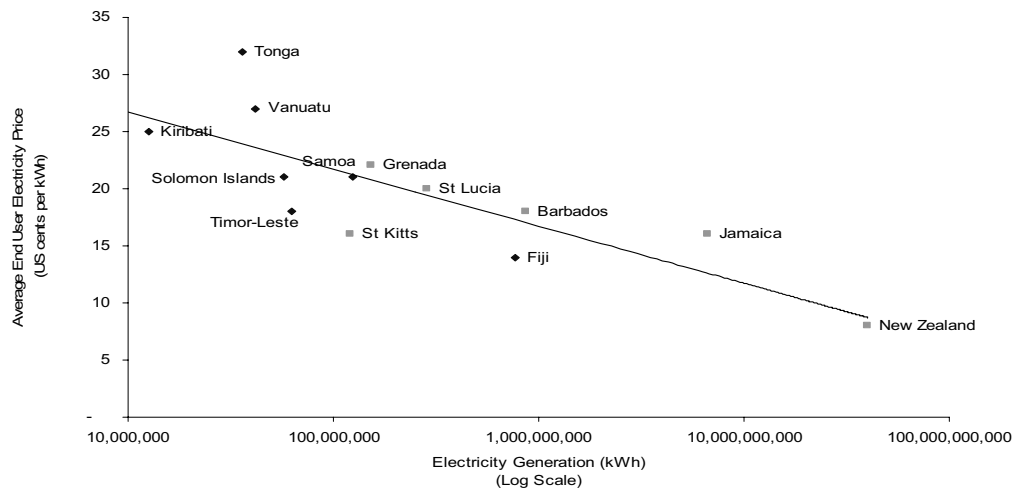
#### *Economies of Scale*

The generation cost of electricity should benefit from economies of scale. Figure A11 sets out the relationship between average end user tariffs<sup>42</sup> and electricity production for most Pacific and comparator countries. It seems that size does have an impact on cost, but it is far from the most important factor.

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<sup>42</sup> It would be better to use cost rather than tariff in this analysis, but that data was not available

**Figure A.11: Economies of Scale in the Pacific**

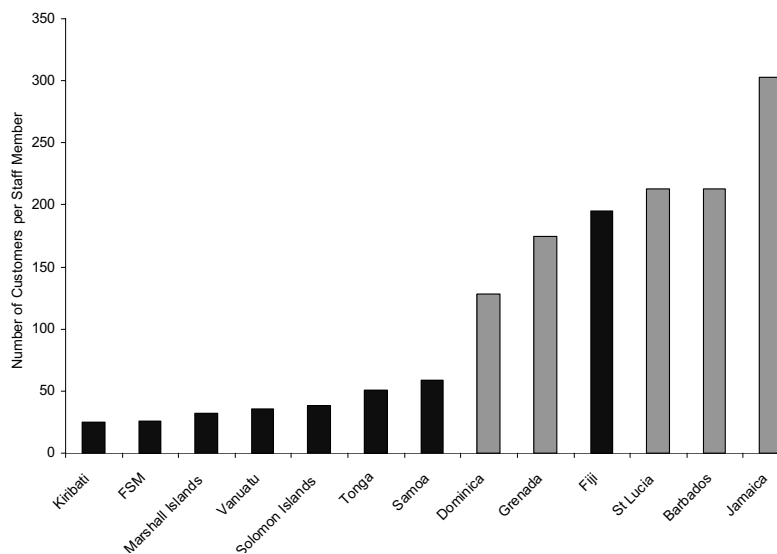


Source: Castalia Source: Castalia Research

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia  
Efficiency

Figure A12 shows staff productivity levels for Pacific and comparator countries. Electricity utility labor productivity levels in Pacific countries are poor compared to other utilities of similar size and level of performance, such as Dominica and Grenada. This can be improved, as the Fiji Electricity Authority (FEA) has shown in the last three years. FEA's experience is described in Box A.6 below.

**Figure A.12: Staff Productivity**



Source: Meritec Report, country supplied data and Castalia Research

Notes: FSM: Federated States of Micronesia

Box A.6: Fiji – A Model of Electricity Rehabilitation

Fiji's electricity is supplied by a wholly government owned entity, the Fiji Electricity Authority (FEA). The FEA is a vertically integrated generation, transmission, and distribution and supply entity established by statute in 1966. The Government appoints the Authority members, and apart from fixing the tariffs and determining major policy (such as dividend and rural electrification policy), the FEA now has independence on all operational and financial matters.

*Prior to 2000, FEA faced significant problems ...*

From 1997 to 2000, the FEA faced significant problems. The organization moved from a profitable to an unprofitable trading entity, while electricity demand was increasing rapidly. The government faced a number of emerging capacity and efficiency problems at a time when the Fijian economy was in poor shape.

*a board with commercial independence and experience was appointed ...*

In 2001, a new Board was appointed with members who had extensive private sector experience, and a commercial focus to the management of the business of the Authority. The FEA was given three years to restructure and return the business to profitability. In the light of subsequent events, this focus was crucial to managing a major set of concurrent problems in 2002 and 2003.

*and major business like reforms were implemented ...*

The major steps in the reform process were:

- Improve efficiency and reduce costs of production
- Reduce system losses
- Raise productivity of labor and capital inputs
- Change accounting practices for accurate recording
  - Introduce private sector operators
  - Manage risk pro-actively
  - Plan for demand growth

*Significant gains were made in 3 years, both financially and operationally...*

Impressive progress was made between 2001 and 2003. US\$35m in costs were carved out (of a business with annual revenues of US\$70m); staff numbers were halved; system losses were reduced from 18 to 10 percent; more efficient diesel generators were installed; surplus assets were sold; crucial engineering maintenance raised operating efficiencies; and collection efficiencies produced one time and permanent increases in revenue.

*outsourcing to the private sector was a key ingredient to success ...*

Outsourced operator management contracts were let to the private sector for the operation of FEA's larger diesel generation plants. A 20 year Energy Conversion Agreement was signed with an American company and a joint venture partnership with an Australian company is being adopted to develop major renewable (hydro and wind) generation projects.

*which helped FEA to cope with a primary energy crisis.*

The reform process coincided with a major capacity crisis in 2002-03. Two very low rainfall years slashed hydro generation capacity, and extensive and expensive use of diesel plant had to fill the supply gap, at a time when electricity demand from a recovering economy was growing rapidly.

FEA managed the crisis well, although the government did provide significant assistance in the form of a US\$4m grant, and the provision of guarantee and

interest rate relief on a US\$9m loan. There is no overt tariff subsidy to FEA from the government: indeed, the requirement for FEA to meet the government's policy of rural and social obligation electrification costs the company about US\$20m a year. This cost is not yet met by the government as required by the Public Enterprise Act, but there is an agreement between the board and the government that no dividend is paid which acts to offset the financial cost of these cross-subsidies.

*The lessons learned from FEA reform are relevant to Pacific countries ...*

A significant part of the success of the FEA reforms has been a government willingness to let the new board operate as a strictly commercial entity, with a profit objective to provide for growth. The relationship between the government and the FEA is open for all to see. This transparency is key to involving private sector operators who require a credit worthy government owned organization with which to agree long term concession, and for the financial institutions which will be funding the US\$285m in electricity investment projects forecast as necessary to meet demand growth over the next few years.

*where clear commercial objectives and transparency of government policy are essential ingredients of successful reform*

Looking ahead, there are questions about the ability of a vertically integrated, state owned, monopoly electricity institution like the FEA to maintain the continuous pressure to achieve better performance and deliver better service. The success of the FEA reforms owes a great deal to the drive and independence of the present chair of the board and the senior management. Their successors may not always have the same attributes. Nor is there any external influence from a competitive market or an independent regulator. These may well become issues for future policy consideration.

Nevertheless, the FEA is an excellent case study of reform in an electricity sector. The focus the board and management has applied on reducing systems losses (including an active campaign on eliminating pilferage), involving private sector partners in the operation of generation assets, removing inefficiencies, increasing customer service standards, fully recovering costs in tariffs, and planning for future growth in demand is a model for needed reforms in other Pacific countries.

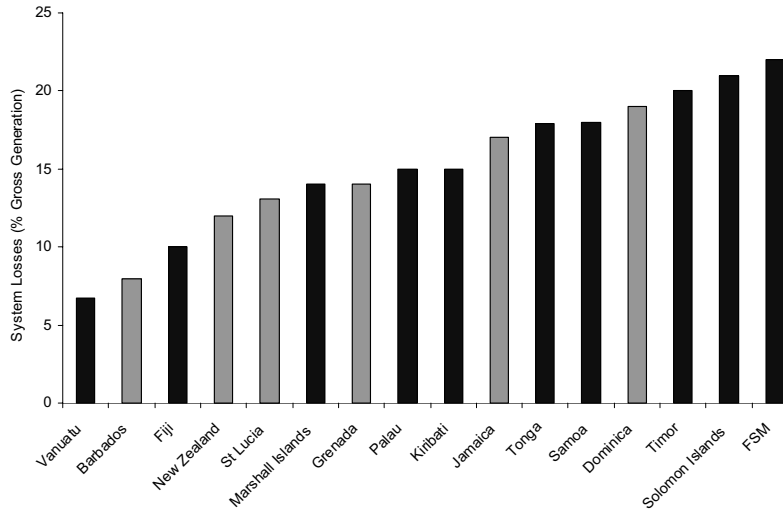
Fiji provides an example of how the electricity sector can become a reliable and viable contributor to economic growth and social cohesiveness, rather than a drag on government budgets and society at large.

*Source: Castalia Interviews with FEA, September 2004*



The overall picture on system loss is not encouraging as shown in Figure A.13. Most Pacific countries have system loss percentages well into double figures with the highest in FSM, Tonga and Samoa, where system losses are running above 17.5%. Vanuatu and Fiji show that it is possible to do much better than this.

**Figure A.13: System Loss**



*Source: Meritec Report, country supplied data and Castalia Research*

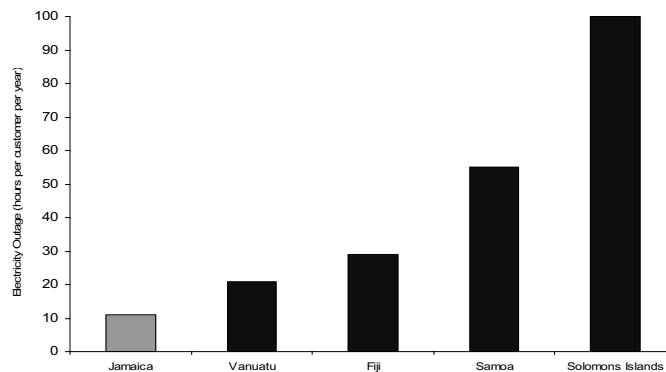
*Notes: FSM: Federated States of Micronesia*

### *Service Quality*

Quality of electricity service is measured by its reliability, and by the stability of frequency and voltage. Most utilities in the Pacific region do not collect data on frequency and voltage fluctuations in the grid, but we were able to get data on reliability for some countries, measured as hours of lost supply per customer per year.

As Figure A.14 shows, Vanuatu performs far better on this measure than the other Pacific countries for which data was available. It does not perform as well as Jamaica, but Jamaica has a much larger system, and higher levels of income, making it easier for the utility to invest in reliability. Fiji has improved the quality of service significantly in the last three years as a result of the reform program described in Box A.6.

**Figure A.14: Service Quality – Electricity Outage Time**



*Source: Country data and Castalia Research*

*Note 1: Vanuatu has been excluded as the very high tariffs and system losses distort the trend data*

*Note 2: FSM: Federated States of Micronesia*

### *Benchmarking Conclusions*

Electricity tariffs are a complex product based on factors including national fuel procurement systems, economies of scale and degree of government subsidy. It is difficult to be definitive on the performance of Pacific countries as far as tariffs go.

What is clear is that Pacific electricity utilities generally perform worse than their Caribbean counterparts (which are of a similar size and income level, and which also depend on imported fossil fuels) at providing access to electricity, have higher system losses and lower labor productivity. Fiji and Vanuatu show that good performance in areas like system losses are possible in the Pacific.

## A.2.2 Institutional Arrangements

The electricity sector in the Pacific region is dominated by government departments or corporatized state owned utilities that are, in general, in regulated monopolies, as shown in Table A.3

Within the Pacific, Fiji and Vanuatu are the best performing utilities, each with different institutional arrangements. It is worth examining the reasons for their relative success:

- Like many other electricity utilities in the Pacific, the Fiji Electricity Authority (FEA) is a corporatized state owned monopoly, which has not been formally regulated to date (FEA's rehabilitation is described in Box A.6). Two critical factors contribute to this utility's success: The Government supported a Board that was commercially independent, and the utility's Chairman and senior management team are exceptionally driven and have employed sound management practices. This example demonstrates that Pacific countries can achieve improved performance through effective public sector reform
- However, the potential for state intervention remains (there is nothing in place in Fiji to stop the government from intervening in the utility performance and targets, as it has done in other state owned corporations like Airports Fiji Limited), and should these good managers leave, it is uncertain whether good performance would be sustained, or whether the utility would revert to the level of performance seen in other corporatized utilities
- Vanuatu's electricity is owned and operated by the private firm UNELCO, under a concession contract with the Government. Among the Pacific utilities it performs best on quality of service indicators, well on labor productivity and has the lowest levels of system loss. UNELCO's tariffs are relatively high, which reflects the fact that it recovers full costs through the tariff, including financing investment. On this basis, it is comparable with other full cost recovery systems in some comparator countries like Dominica in the Caribbean. Tariffs are lower than those in Tonga, where the utility is also privately owned and operated
- Private participation in generation has been implemented in the Pacific. Fiji, Palau and Federated States of Micronesia. These three countries have some of the lowest electricity tariffs in the region. Private operators have also indicated interest in generation in Kiribati (see Box A.7). Provided contracts are well-structured, private operators have the incentive to run electricity generation assets as efficiently as possible.

**Table A.3: Industry Structure and Governance Arrangements**

	Smaller Islands – Vertically Integrated											Larger Countries		
	Private						Public					Public	Private	Public
	Barbados	St. Lucia	Dominica	Grenada	Vanuatu	Tonga	Kiribati	Marshall	FSM	Palau	Fiji	Jamaica	Timor	
Supply Corporatized	Y	Y	Y	Y	Y	Y <sup>2</sup>	Y	Y	N	N	Y	Y	N	
Board of Directors Autonomous from Executive Branch	Y	Y	Y	Y	Y	N	Y		N	N	Y	Y	N <sup>1</sup>	
Transparent Legislation	N	N	N	N	N	N			N	N	Y	Y	N	
Vertical Unbundling in Power Industry	N	N	N	N	Y	N	N	N	N	N	N	N	N	
Horizontal Unbundling in Power Generation	N	N	N	N	N	N	N	N	N	N	Y	N	N	
Horizontal Unbundling in Power Distribution	N	N	N	N	N	N	N	N	N	N	N	N	N	
Independent Power System Operator	n.a. <sup>3</sup>	n.a.	n.a.	n.a.	Y	n.a.	n.a.	n.a.	n.a.	n.a.	N	N	N	
Power Single Buyer <sup>6</sup>	Y	Y		Y	N	N	N	N	N	N	Y	Y	N	
Power Bilateral Contracting	N	N	N	N	N	N	N	N	N	N	N	N	N	
Power Pool/Wholesale Market	N	N	N	N	N	N	N	N	N	N	N	N	N	
Private Management of Power Industry (% of total capital)	100	59	100	90	100	100 <sup>4</sup>	0	0	0	0	80 <sup>5</sup>	0	0	

NOTES:

1 The Timor-Leste Government intends to convert EDTL (Electricidade de Timor Leste) into an autonomous public company in 2004

2 Although the power operation has been “corporatized” in the form of a concession contract, it is to a company controlled by the Crown Prince of Tonga. There is no effective separation from the executive branch of the Government

3 n.a.: Not Applicable

4 This is owned by the Crown Prince as a private individual

5 Estimated

6 Single buyer means buying from third parties

There is great potential for improvement in the efficiency and customer service standards of the sector, but major change is required to the way in which governance and management applies to the institutions.

Box A.7: Private Sector Interest in Kiribati

The Kiribati Public Utilities Board is responsible for electricity and water on South Tarawa. The Ministry of Works and Energy oversees the electricity sector for the remainder of the country. Most electricity in Kiribati is diesel generated, although some households also employ solar panels.

It is often argued that small countries like Kiribati will not be able attract private sector interest due to small markets and potentially lower revenues. However, this is not the case. There have been suggestions of introducing Independent Power Producers (IPPs) in Kiribati and at least three private operators (Island Power, Telesource and a company in Guam) have expressed interest. Although this concept has been put to the Government of Kiribati, Ministry personnel expressed reservations that this interest may not convert to actual commitments due to low returns, but there is no basis yet upon which to confirm that this will in fact be the case. The fact that some companies have actually expressed interest, knowing the size and scale of the Kiribati market, and having operated in other small Pacific Island countries (e.g. Telesource is involved in power generation in Fiji and the Federates States of Micronesia as well), suggests that the interest is real.

At any rate, it would not hurt for Kiribati (or other small island states for that matter) to test the interest by giving the private sector the option to tender for services. The worst case scenario is that competitive bidding does not eventuate. In this case, the country could choose to appoint the single bidder if there is one, or continue with current government operations having lost very little. On the other hand, if the private sector interest is real, the country has much to gain.

*Source: Castalia Interviews with Kiribati Ministry of Works and Energy and Public Utilities Board, September 2004*

### *Regional Cooperation in Electricity*

Through the auspices of the Pacific Islands Forum Secretariat, based in Suva Fiji, there has been considerable focus in recent years on regional cooperation. All the countries covered by this Review, with the exception of Timor Leste, are full members. Timor has observer status at present.

Considerable efforts are being made through institutions like the Pacific Islands Forum Secretariat to improve the co-ordination machinery in Pacific countries. Much of it is directed at high level policy, and increasingly on security and sustainability-of-nation-state issues. However, there are a number of agencies providing policy co-ordination and practical advice in the energy sector: the Pacific Islands Forum Secretariat; the Committee of Regional Organizations of the Pacific (CROP) Energy Working Group; the Pacific Islands Development Program (PIDP); and the South Pacific Applied Geosciences Commission (SOPAC). The CROP Group has prepared a regional Energy Policy and Plan which sets out a useful framework for energy policy planning in the Pacific. Box A.8 summarizes the plan.

There are a number of private regional organizations, including the Pacific Power Association (PPA) and the Pacific Water Association offering help to utilities in the region. The PPA is involved the most with practical assistance to electricity utilities in the region.

The Pacific Power Association (PPA) plays an important coordinating role in the Pacific. It provides technical assistance support, as well as benchmarking the relative performance of electricity utilities in the region. It makes a positive contribution although a higher level of commitment from Pacific country governments – who own all utilities – to the work of the PPA and additional funding from governments and donor or lending agencies would have a significant payback in terms of improved performance. The FEA success story is a good one to emulate in the region, perhaps through the FEA, and with the support of the PPA and the Pacific Islands Forum Secretariat.

The South Pacific Regional Environmental Program (SPREP) is an organization with a mandate to promote cooperation in the Pacific region to protect and improve the environment and ensure sustainable development. It has a specific interest in energy related issues in the region and is the executing agency for the Pacific Islands Renewable Energy Project (PIREP), a GEF/UNDP funded regional climate change mitigation project aimed at developing and commercializing renewable energy systems to reduce the long term effects of growth in greenhouse gas emissions from fossil fuel use.

There is another form of regional cooperation in the form of common private sector ownership or operation of electricity assets. For example, Vanuatu's UNELCO is part of the same group that serves New Caledonia and Tahiti, allowing them to draw on an experienced senior management pool in the region.

Box A.8 : Pacific Islands Energy Plan and Policy

In 2002, a *Pacific Islands Energy Policy and Plan* was prepared by the Committee of Regional Organizations of the Pacific (CROP). The Plan is a useful summary of the major problems facing the energy sector in Pacific countries and suggested some policy options for the future. With respect to the electricity sector, the document said:

“Reliable and affordable electric power is essential for economic development and social progress. Key issues related to power supply include insufficient human resources, inefficient performance of some utilities, inefficient consumption of electric power, and inadequate regulatory and legislative frameworks to support private sector participation and investment. The goal for the power sector is:

Reliable, safe and affordable access to efficient power for all Pacific islanders in both rural and urban parts of the region.

Policies outlined were:

- Improve the efficiency of power production, transmission and distribution to optimize costs and fuel consumption
- Develop corporatization and commercialization mechanisms for power utilities to facilitate improvements in power production, transmission and distribution
- Expand where appropriate private sector participation, investment, ownership, and management arrangements for electricity generation, transmission and distribution
- Establish an enabling and competitive environment for the introduction of independent power providers where these may provide efficient, reliable, and affordable service to consumers
- Promote appropriate international best-practice regulations and standards for the safe and reliable supply, generation, transmission and distribution of power
- Support the introduction of new commercially proven technologies and generating systems that are environmentally, economically, financially and socially viable.

This framework of encouraging efficiency of existing operations, creating a more conducive climate for private sector participation in generation and supply, and establishing a responsive and accountable regulatory regime are key elements to addressing some of the poor performance statistics outlined above.

*Source: Castalia Research and CROP Energy Working Group, October 2002, page 7*

### A.3 Water and Sanitation Sector Analysis

Pacific countries have varying levels of water availability. Papua New Guinea, Fiji and Vanuatu have a relative abundance of water, while other countries like Kiribati, Marshall Islands and Palau do not have rivers and lakes, but depend on rainwater collection.

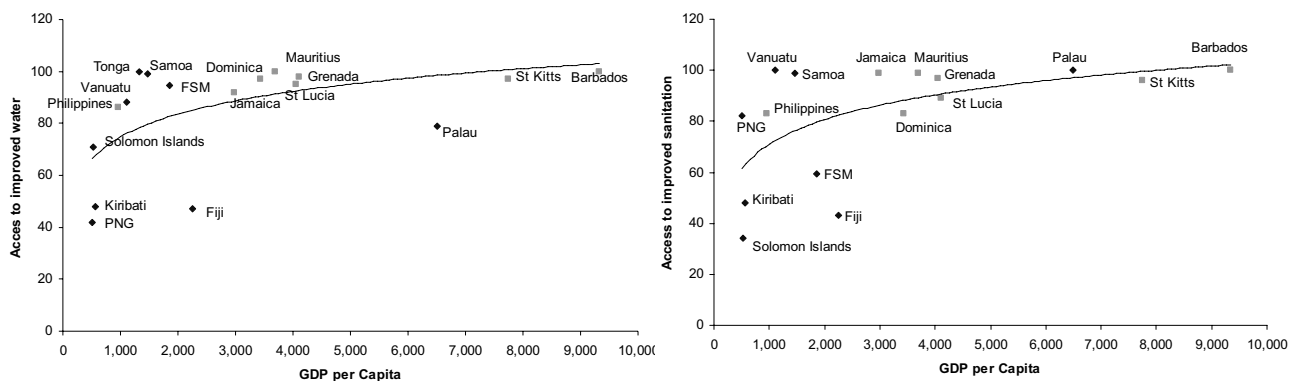
While countries have little control over the natural availability of water, sector infrastructure and institutions can help to ensure that this (sometimes scarce) resource is used efficiently, effectively and conservatively. This section examines the quality and performance of water and sanitation infrastructure in Pacific countries.

#### A.1.3 Benchmarking

##### Access

Figure A.15 compares the levels of access to improved water and sanitation within Pacific and comparator countries. Improved water includes reticulated supply and rainwater catchment tanks. Improved sanitation refers to both reticulated and non-reticulated solutions such as improved pit latrines.

**Figure A.15: Access to Water and Sanitation**



Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

The trend line in these graphs indicates the expected level of access to improved water and sanitation given a country's GDP per capita. The wealthier the country, the higher we would expect access to water and sanitation to be. Countries that lie above this trend line are outperforming expected access levels, while countries that fall below the line have relatively poor access levels, given their income.

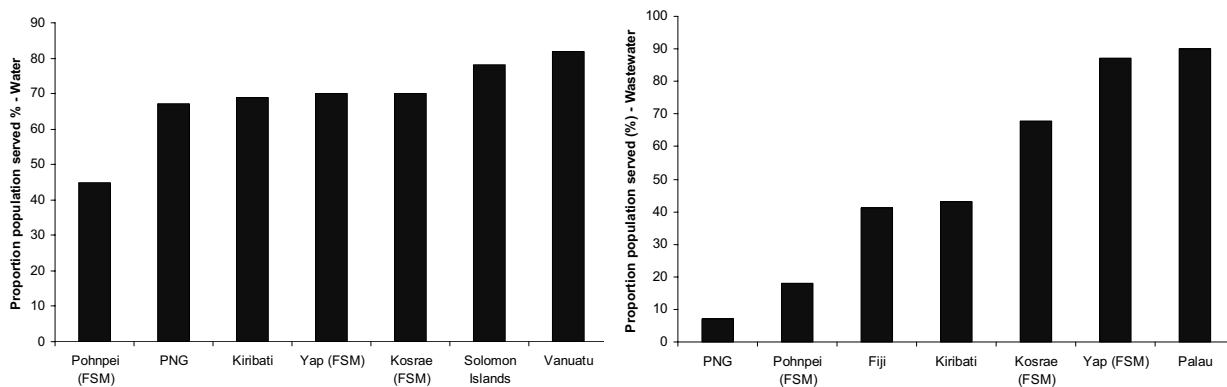
Only Tonga, Samoa, Federated States of Micronesia and Vanuatu provide access to improved water services to over 80% of the population, while Vanuatu, Samoa, Palau and Papua New Guinea report that over 80% of the population have access to improved sanitation. On the whole access in the Pacific countries is worse than in the Caribbean or the Philippines.



Access to reticulated water and sanitation, which is the real focus of water companies, generally falls significantly below these figures. In Kiribati for example, piped water only accounts for 48% of the total access figure for 2000. The remainder of the water is classed as access to ‘rain water’ and ‘protected wells’. In Tonga, the 1996 Population Census Report recorded that 57% of households had access to piped water supply, while other households accessed water through private tanks, wells or other means. Access to water and sanitation also varies substantially between urban and rural areas within each country, with rural access levels being lower.

Figure A.16 shows the proportion of population served for water and sanitation in the utility coverage areas.

**Figure A.16: Proportion of Population Served – Water Utility Coverage Area**



Source: Pacific Water Association, 2001 Benchmarking Survey  
 Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

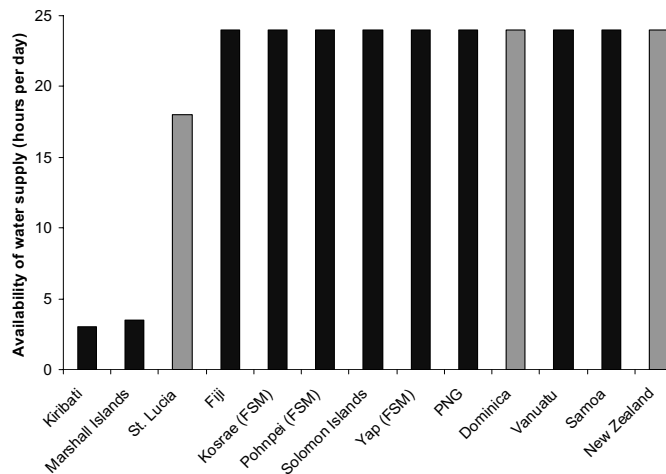
Water utilities in Kiribati and the Solomon Islands achieve higher levels of access in their coverage areas than is reflected in the overall access statistics. This reflects the difficulty in providing access to rural and remote areas when island groups are dispersed, and reinforces the difference in access to service between urban and rural areas.

### Quality

Some countries produce drinkable water, but continuity of supply is often a problem. Figure A.17 compares the reliability of service for utilities in several Pacific and comparator countries.

Vanuatu, Solomon Islands, Federated States of Micronesia and large towns in Samoa, Fiji and Papua New Guinea all have continuous service. By comparison, Kiribati and Marshall Islands provide service for only a few hours each day. There is a reluctance to extend service hours in these countries due to limited water resources and water storage capacity. Three hours of water is enough to fill a small tank in the average Kiribati home.

**Figure A.17: Availability of Water Supply**



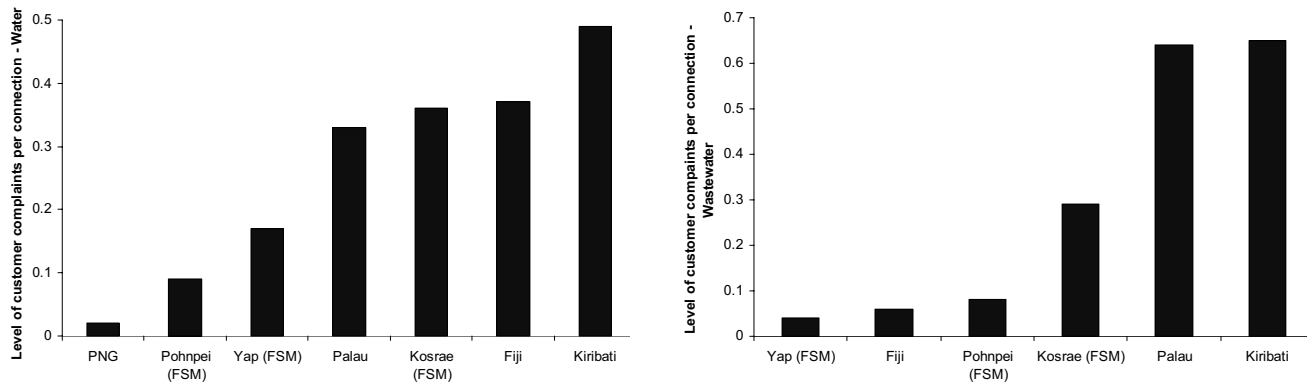
Source: Castalia interviews, WDI data and Pacific Water Association 2001 Benchmarking Survey

Note 1: PNG: Papua New Guinea, FSM: Federated States of Micronesia (PNG figures are for Madang and Rabaul areas only. Overall service levels are not known).

Note 2: Large towns in Fiji have 24 hours of supply a day, but most other towns get between 18 to 20 hours of supply per day. In Samoa, Apia enjoys 24 hour a day supply, while rural towns get 14 – 18 hours and more remote towns, only 8. In Kiribati, water is available for between 3 and 8 hours a day to most of population on Tarawa.

The number of customer complaints per connection is another good indicator of quality of service. Figure A.18 provides an overview of customer satisfaction for water and sanitation services, comparing customer complaint levels.

**Figure A.18: Level of Customer Complaints**



Source: Pacific Water Association, 2001 Benchmarking Survey

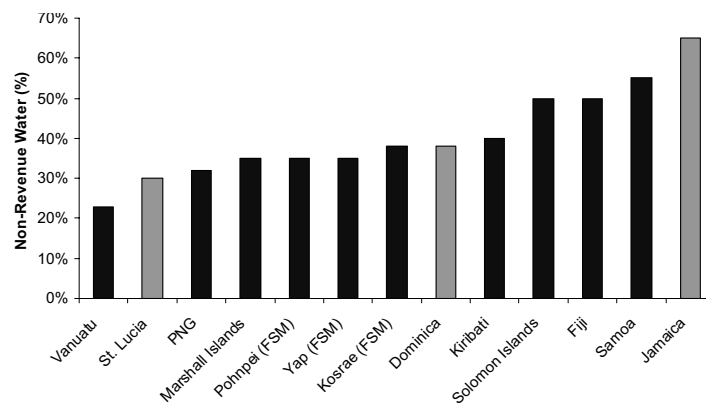
Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Kiribati, Palau and Kosrae in Federated States of Micronesia have a relatively high number of complaints per connection for water and wastewater services. Fiji has a high number of complaints for water, but far fewer for wastewater.

## Efficiency

To get an understanding of the relative efficiency of water utilities in Pacific countries, we examined utility staffing levels and non-revenue water for utilities where data were available. Figure A.19 shows non-revenue water for five Pacific countries and two comparator countries. Non-revenue water is an important measure of efficiency. It refers to the difference between system input volume and the billed or authorized consumption, and includes unbilled consumption from faulty meters, illegal connections or under-billing as well as physical losses from leakages and overflows<sup>43</sup>.

**Figure A.19: Non-Revenue Water**



Source: Castalia interviews and Pacific Water Association 2001 Benchmarking Survey

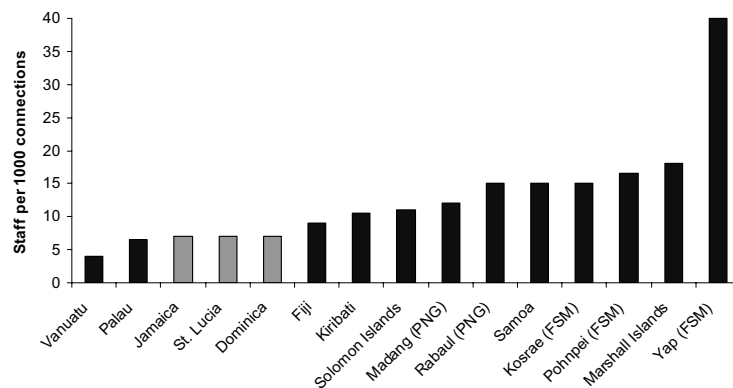
Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia, Vanuatu figures are for Port Vila

Water utilities in many emerging markets are able to achieve levels of between 20% - 30% non revenue water. Of the Pacific countries, Vanuatu performs best with losses of less than 25%. Samoa, Fiji, Solomon Islands and Kiribati perform worst with estimated losses of between 40% and 55%, although in the case of Kiribati, loss levels have significantly reduced from 60% following the rehabilitation of a major pipe to Betio.

High staffing levels are another indicator of inefficiency. Figure A.20 shows that with the exception of Vanuatu, Palau and Fiji, the Pacific water utilities all have over 10 staff per 1000 connections.

<sup>43</sup> We have used the term non-revenue water in this paper instead of unaccounted for water. Statistics for Marshall Islands, PNG, Fiji and Kiribati are “non revenue water” and Vanuatu, St Lucia and Jamaica are “unaccounted for water”.

**Figure A.20: Staff per 1000 Connections**



Source: Various. Papua New Guinea figures are for Madang and Rabaul areas only<sup>44</sup>.

Notes: FSM: Federated States of Micronesia

Many water companies are able to operate effectively on less than four staff per 1000 connections. In the Pacific, only Vanuatu attains this level of operation.

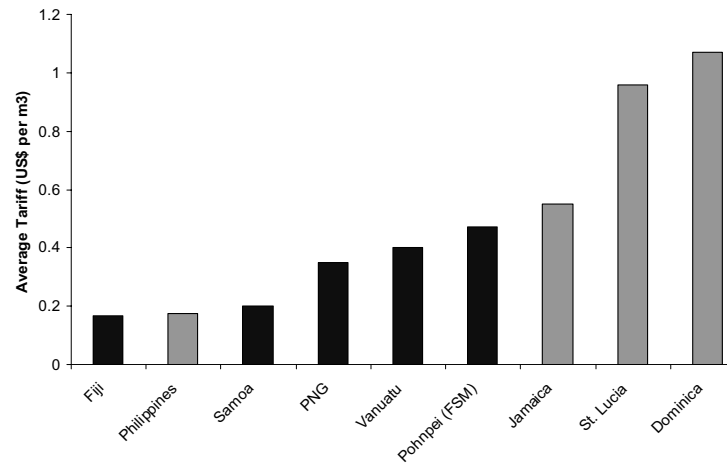
#### *Tariffs and Cost Recovery*

In most Pacific countries, water tariffs have remained unchanged for many years. Figure A.21 shows that tariffs in Samoa and Fiji are extremely low when compared with Vanuatu for example, where UNELCO is allowed to recover the full cost of operation<sup>45</sup>. Kiribati (not graphed here) also has a very low tariff. Piped water costs a flat rate of \$10 AUD per month irrespective of the amount of water used. These low tariffs are not due to low costs, but rather to government subsidies and underinvestment in infrastructure.

<sup>44</sup> The Papua New Guinea Water Board offices in Madang and Rabaul record levels of 12 and 15 staff per 1000 connections respectively. These two areas were the focus for recent ADB technical assistance projects.

<sup>45</sup> "Infrastructure Regulatory Review for Government of Vanuatu", Castalia, July 2004

**Figure A.21: Average Tariff (US\$ per cubic meter)**



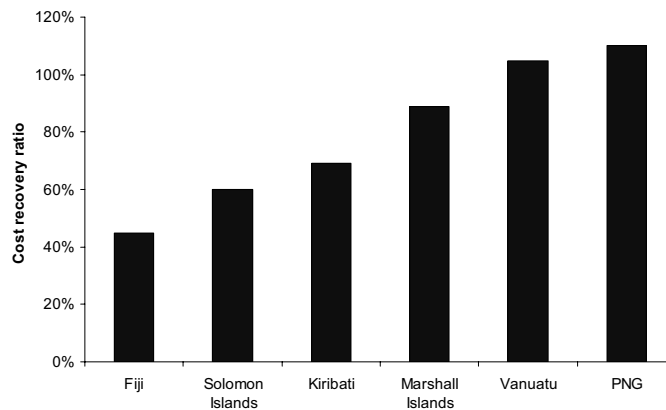
Source: Various

Note 1: St Lucia and Dominica rates for water and sewerage

Note 2: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Cost recovery is an important indicator for water utilities. The higher the cost recovery ratio of a utility, the less reliant it is likely to be on government subsidies.

**Figure A.22: Cost Recovery Ratio**



Source: Pacific Water Association Benchmarking Survey 2001, "Special Evaluation Study on Asian Development Bank Capacity Building Assistance for Managing Water Supply and Sanitation to Republic of the Fiji Islands, Kiribati, Papua New Guinea and Republic of the Marshall Islands", March 2003

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Figure A.22 shows the cost recovery ratios for four Pacific countries based on an ADB evaluation in 2003. Most notable is Vanuatu's UNELCO and the Papua New Guinea Water Board (PNGWB), which have managed to achieve a total cost recovery of over 100%

including full operating expenses and depreciation. This was achieved by setting cost-reflective tariffs, improving the utility's billing efficiency and cost control measures. Both utilities have achieved tariff increases with government approval. This enabled a move toward overall profitability<sup>46</sup>. Both UNELCO and the PNGWB are required to be self-financing and generate a return on investment. Other water utilities such as those in Fiji and Samoa rely on government subsidies to make up the difference between the tariff and actual operating costs. Loans and donor aid fund major capital works projects.

#### **A.4 Institutional Analysis and Recommendations**

Most water and sanitation utilities in the Pacific region are either government departments or government owned organizations responsible for urban supply. Table A.4 and Figure A.23 provide an overview of the institutional arrangements in the Pacific water and sanitation sectors.

There is an urgent need to reduce costs and improve the quality and efficiency of service delivery in the water supply and sanitation sector. While scale issues will be an ongoing challenge for the Pacific countries, the performance of UNELCO in Vanuatu and, (albeit to a lesser extent), areas served by the Papua New Guinea Water Board's, demonstrate that despite these challenges, improved performance is possible with better commercial and management practices.

Water resources are an issue for some Pacific countries, but existing management practices have resulted in inefficiencies, which increase costs further, for example Kiribati has high non-revenue water, no metering and low tariffs. Pacific countries could therefore benefit from focusing on institutional changes to improve performance. Commonly recommended approaches to institutional improvement include:

- Corporatization
- Private Sector Participation
- Regulation
- Ensuring that any subsidies are paid for provision of outputs.

The following sections review experience in the Pacific with each of these approaches.

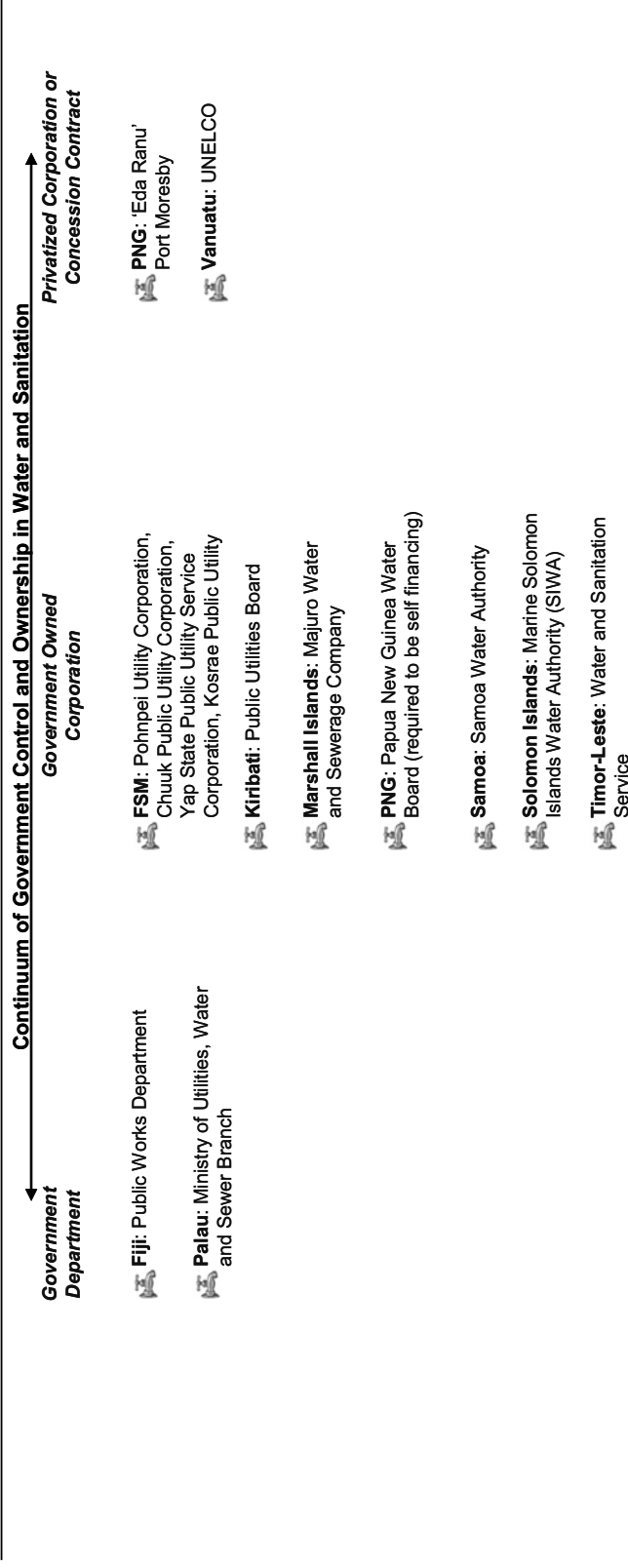
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<sup>46</sup> The overall profitability level is not reflected every scheme in the Papua New Guinea Water Board. Some systems are cross subsidizing smaller and less profitable ones. The ADB recommended introducing a regional tariff structure reflecting the cost of water supply in each location. This had not been implemented by 2003.

Table A.4: Institutional Indicators in the Water and Sanitation Sector

	Fiji	Kiribati	Marshall Islands	FSM	Palau	PNG	Samoa	Solomon Islands	Timor Leste	Tonga	Vanuatu
Independent Regulator (Y/N)	N	N	N	N	N	N	N	N	N	N	N
Private Participation (Y/N)	N	N	N	N	N	N	N	N	N	N	Y
Does Tariff Cover Costs? (Y/N)	N	N	N	N	N	Y	N	N	N	N	Y
Water and Sanitation covered by same provider?	Y	Y	Y	N	Y	Y	N	N	Y	N	N

Figure A.23: Government Ownership in Water and Sanitation Utilities



Source: Various, Castalia Research  
Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

**Corporatization** is often employed to help improve the operational and financial performance of water and sanitation utilities. In Kiribati and the Marshall Islands, coporatization failed to deliver improved commercial focus and management capacity<sup>47</sup>. In Samoa, corporatization has resulted in improved indicators in some areas, but not yet in others. While making the goals of corporatization more explicit, and providing additional capacity building assistance may go some way towards helping to improve performance indicators, it would appear that corporatization alone does not reliably result in incentives to reduce costs or increase revenue on a sustainable basis. The following examples describe Pacific countries' experience with corporatization:

- **Fiji:** In the late 1990s, two TAs were provided to develop a corporatization plan for the Public Works Department. The aim was to establish a wholly government-owned limited liability company with clear commercial objectives, accountability and operational autonomy. Recommendations for corporatization were implemented briefly (“on paper”), but the water utility soon returned to its original state as a government department with no financial or decision making independence during the political upheaval in 1999 and 2000. The Ministry of Works’ Public Works Department resuming all responsibility for water and sewerage. The Government’s intention is to internally restructure the Water and Sewerage Department to improve its operations to the point where it can operate without additional Government funding, after which it will be corporatized; perhaps in 2005. Throughout these changes, the utility’s performance has not improved, and in some cases, performance indicators have deteriorated. Water tariffs are held below costs and are subsidized by the Government. The water utility has no control over its budget and the existing allocations from Government do not allow for system improvements and general maintenance
- **Kiribati:** Loans and TAs<sup>48</sup> were provided to facilitate institutional reform through corporatization. Reforms included setting up a Board of Directors<sup>49</sup>, developing Management Information Systems (MIS) to support management, and drawing up a corporate plan for the utility. Neither service delivery nor financial performance had significantly improved by 2003. Tariffs are very low and are not sufficient to cover operating costs. This coupled with a significant increase in population numbers on South Tarawa has resulted on poor service and water quality. However, unaccounted for water has reduced to around 40% following the replacement of a major pipe to Betio under the ADB-financed Sanitation, Public Health and Environment Improvement (SAPHE) project.
- **Marshall Islands:** Technical assistance in the Marshall Islands was aimed at improving utility performance through changing the composition of the Board of Directors to ensure a balance between government and non-government representation, and strengthening the Majuro Water Supply Company’s financial planning, management and operational capacity. This has not resulted in improved operational and financial performance. In fact, performance has deteriorated. The Board of Directors meets irregularly and depends on the utility’s

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<sup>47</sup> “None of the utilities conveyed any real attempt or wish to optimize revenue or reduce costs” ADB, March 2003

<sup>48</sup> The ADB’s first TA to design a “Corporatization Plan for the Public Utilities Board” was approved in 1997

<sup>49</sup> ADB TA 2811-KIR “Corporatization Plan for the Public Utilities Board, June 1997



executive management for decisions. Executive management has not agreed to the commercial targets suggested

- **Samoa:** In 1992, the Samoa Water Amendment Act created an independent, corporatized utility owned and regulated by the Samoan Government. Corporatization has introduced some positive improvements, particularly in the areas of billing, collection and operational efficiency. Although the Samoa Water Authority is still primarily financed via grants, the organization has significantly improved collections, introduced a separate commercial tariff and implemented an overall tariff increase in 2003. The utility is focused on increasing metered connections to assist with billing and collection. Around 50% of water supply in Samoa is now metered and all new connections are installed on a metered basis.

In addition to the tariff increase, the Water Authority has introduced connection and disconnection charges and penalties for non-payment. The Samoa Water Authority has also reduced staff numbers from 320 to 148 over the past five years. Non revenue water remains a key focus for the utility. It increased from 15% in 1992 to 50% in 1996<sup>50</sup> and is currently at around 55%<sup>51</sup>. A leak detection program has been successful in helping the authority to focus on areas in which major pipes have fallen into disrepair. The Authority aims to achieve a target of between 20% and 30% non-revenue water in the next three years.

- **Papua New Guinea:** In the Papua New Guinea Water Board, technical assistance efforts were focused on developing management and information systems to strengthen the capacity of executive management, upon whose decisions the existing Board of Directors depend. Operational and financial indicators have improved in some, but not all coverage areas. This is an example of where technical assistance can work, given the right environment. Success factors include a Board comprised of both public and private members, a level of independence from the Government and a utility allowed to recover its full operating costs with Government support for reasonable tariff increases.

***Private Sector Involvement:*** The Pacific country with the best performing water utility is Vanuatu. Compared with the other Pacific countries it has:

- High levels of access to improved water and sanitation
- Low levels of non-revenue water
- The lowest ratio of staff to connections
- 24 hour, high quality water supply

Vanuatu's success in delegating water service responsibility to a private company may offer lessons for other Pacific Island countries. Until the mid-1990s, urban water services in Vanuatu were provided by the Public Works Department. During this time, the utility's performance mirrored that of some of the other Pacific countries: it was unable to cover

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<sup>50</sup> "Regulatory Framework and Transaction Models for Private Participation in Infrastructure in Pacific Island Countries", Meritec Limited Report for the World Bank, October 2001.

<sup>51</sup> Castalia interview with Samoa Water Authority

operating costs, collections levels and service quality were low, and there was little investment capital available.

The Government let a concession contract in 1994 which allowed UNELCO (the existing privately-owned electricity operator) to supply water and electricity services to Port Vila for a period of 40 years. Under this contract, all management, operating and investment functions are delegated to the concessionaire. Asset ownership and contract performance monitoring is controlled by the Government based on periodic technical and financial reports. Under this concession, UNELCO is required to guarantee quality, quantity and continuity of service and incurs penalties for non-compliance.

The concession has been operating for ten years. In this time, it has delivered significant service benefits including<sup>52</sup>: service continuity for 24 hours a day, reductions in non-revenue water, and network expansion. Annual losses of US\$440,000 in 1991 were transformed into a reported surplus of US\$12,000 in 2000.

Private sector involvement via a concession has also been implemented in the Port Moresby water utility 'Eda Ranu' in Papua New Guinea. Until 1996, Port Moresby's water services were provided by the National Capital District Commission, the local government for the National Capital District region. In 1996, Eda Ranu was formed on the basis of a 22 year BOT contract. JC-KRTA, a Malaysian company, was engaged to maintain and operate the water and sewerage network in the capital city in conjunction with a government owned company called Water and Sewerage Pty Ltd.

We were unable to collect detailed benchmarking information from this utility for comparative purposes, but some reports suggest that this has been less successful. Problems in the tender process, and a flawed contract, which gave the private operator responsibility for the supply, but not the distribution side of the water system, have been noted as some of the reasons behind poor performance. For example, under the contract, the private operator is not responsible for leaks, illegal connections, low water pressure or water shortages. This provides few incentives for good quality service delivery.

**Regulation:** There are no independent regulatory authorities for the water and sanitation sector in the Pacific and any oversight or monitoring functions are performed by the Government Ministry responsible for the water sector, if at all. With the exception of Papua New Guinea Water Board and Vanuatu's UNELCO, tariffs do not cover the utilities' operating costs.

Where the utility is run by a private operator under a concession contract, contract monitoring is key. This requires legal, financial and engineering skills. Although it is possible for Governments to oversee the contract monitoring function, smaller countries may not have the specialist resources or capacity in-house.

One solution to this issue is to create a small specialist contract monitoring unit, as a separate legal entity outside of the Ministry, whose task it is to enforce contracts. Additional specialist analytic capability could be contracted in from regional firms to complement permanent staff when workload or expertise requirements exceed the norm. Alternatively, a regional regulatory body could be considered.

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<sup>52</sup> "A Case Study of the Privatisation of Port Vila", John Chaniel, UNELCO Vanuatu Ltd; "Infrastructure Regulatory Review for Government of Vanuatu", Castalia, July 2004

**Output Based Subsidies:** For social and political reasons, it is often necessary to hold tariffs below cost. In such cases, it is important that this is done explicitly, and that a subsidy is provided which, together with tariffs, allows the utility to recover its costs. Subsidy provision should not come at the cost of accountability. One solution to this is for governments to pay the subsidy on an output basis. That is, the subsidy should be paid per unit of water supplied or customer connected, thereby ensuring that there are still incentives for the utility to operate efficiently. Output based aid mechanisms are discussed further in Box 7.6.

## A.5 Roads Sector Analysis

Road networks in the Pacific are government owned, as in most countries. In the past, projects, policies and funding for road construction have taken priority over road maintenance and operations in Pacific countries, contributing to poor road quality. Because of this, in recent years, policy emphasis has shifted from road network extension to upgrading, maintaining and improving road management efficiency.

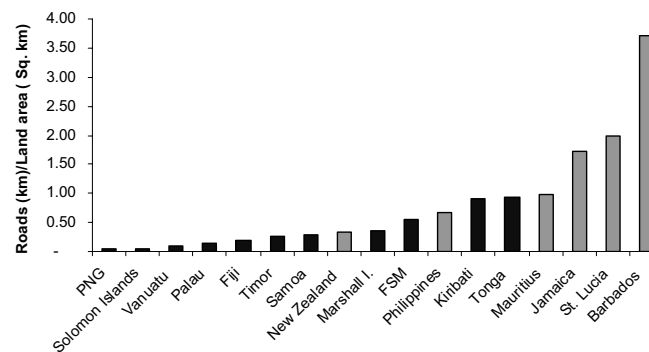
### A.1.5 Benchmarking

This section compares the performance of Pacific countries against the indicators of road coverage and road quality.

#### Road Coverage

The adequacy of a road network is evaluated by the extent to which it connects key communities throughout the country and whether it can accommodate existing and expected levels of traffic.

**Figure A.24: Road Network Density**

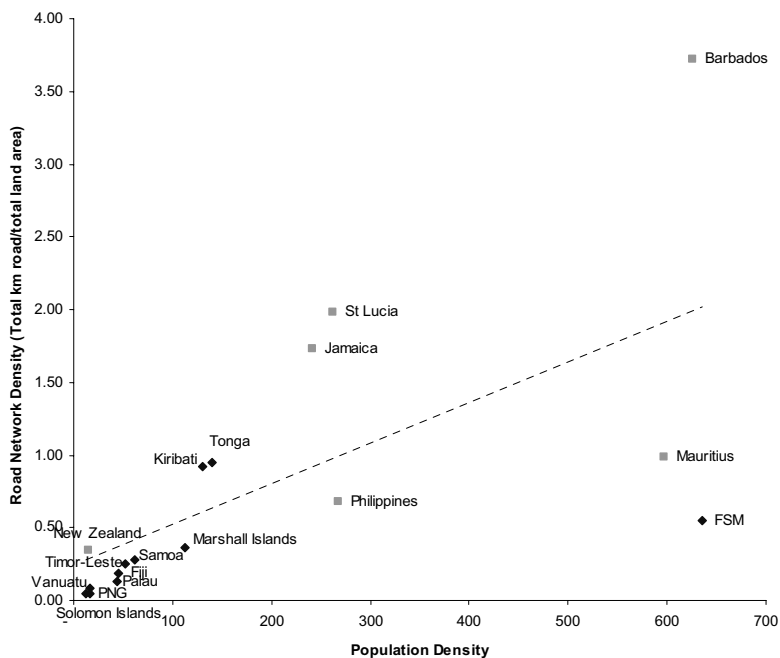


Source: Road km data from *CLA World Fact Book*, land area figures are from *WDI database (latest data)*

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Figure A.32 compares the density of the road networks in Pacific and comparator countries by dividing the total kilometers of road in each country by that country's total land area. Road networks are strongly influenced by the geography and topology of a country. They are also influenced by population density. Figure compares road network density with population density in Pacific and comparator countries. The trend line illustrates the expected relationship between the two.

**Figure A.25: Road Network Density vs. Population Density**

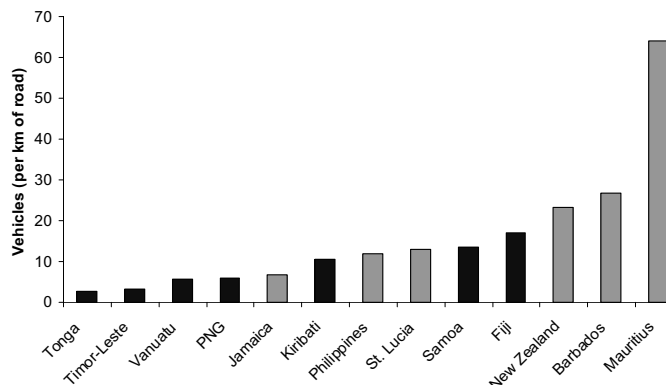


Source: Road km data from *CLA World Fact Book*, population figures are from *WDI database (latest data)*  
 Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Most Pacific countries have fewer roads per square kilometer than would be expected given their population densities. In Vanuatu for example, a significant number of people live in the interior of Efate Island and Espiritu Santo Island but have no road access from their settlements to the coast road. Figure A.26 compares the number of vehicles per kilometer of road in Pacific and comparator countries.

This graph shows that none of the Pacific countries have especially heavy traffic relative to the size of their road networks and Tonga has the lowest number of vehicles per kilometer of road. Although these graphs do not taken into account the differences in access between rural and urban areas, they suggest that the road density in Pacific island countries is adequate, given the size of the population and traffic.

**Figure A.26: Number of Vehicles per km of Road**



Source: WDI Indicators, Timor-Leste information from 2004 World Bank Sector Investment Program Report, Kiribati vehicle statistics from Ministry of Works interview, Samoa statistics from World Bank Samoa Transport Sector Review Report 2003

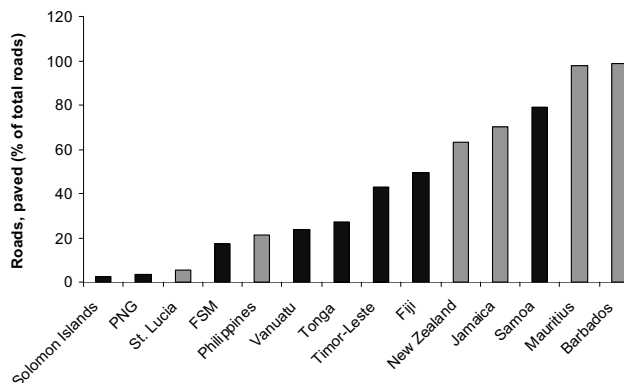
Note 1: Statistics are based on available data for the years 1996 – 2003 and some data may be outdated

Note 2: PNG: Papua New Guinea

### Road Quality

Road quality can be evaluated by reviewing the number of paved or all weather roads, the number of days per year of road closures on main routes and the need for repairs on major routes. We were able to obtain data on paved roads as a percentage of the total road network. This is shown in Figure A.27.

**Figure A.27: Paved Roads as a % of Total Roads**



Source: WDI Indicators, Timor-Leste information from 2004 World Bank Sector Investment Program Report, Samoa statistics from World Bank Samoa Transport Sector Review Report 2003

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

Paved roads account for a far lower proportion of the total road network in the Pacific than in most comparator countries. Of the Pacific countries, Samoa, Fiji and Timor-Leste have the highest percentage of paved roads at over 40%, followed by Tonga, Vanuatu and the

Federated States of Micronesia at between 15 and 30%. Less than 5% of roads in the Solomon Islands and Papua New Guinea are paved<sup>53</sup>.

Paved roads last longer and require less maintenance than gravel or earth roads. However, the percentage of paving alone is not a good indicator of road quality. For example:

- Based on pre-1997 information, over 40% of the road network in Timor-Leste is bitumen paved, but road standards are poor<sup>54</sup>
- In Vanuatu, the condition of the road network is poor due to a combination of substandard construction and inadequate maintenance. The provincial road network consists largely of single lane earth roads that are impassable for long periods of time<sup>55</sup>
- Papua New Guinea has a fragmented network of roads, most of which have been poorly maintained. Maintenance projects aimed at improving road quality have not achieved the intended benefits and the overall condition of the road network has in fact declined<sup>56</sup>.

### A.2.5 Institutional Analysis

Table A.5 summarizes the institutional arrangements in the roads sectors in the Pacific countries. In all countries, the Government Ministry(ies) responsible for works and transport has responsibility for planning, design, construction and maintenance of public roads.

**Table A.5: Institutional Arrangements in the Roads Sector**

Institutional Arrangements	Fiji	FSM	Kiribati	Marshall Islands	Palau	PNG	Samoa	Solomon IIs	Timor-Leste	Tonga	Vanuatu
Is there an Independent Regulator?	N	N	N	N	N	N	N	N	N	N	N
Is there private sector involvement in road:											
- Construction	Y		N			Y	Y	Y	Y	Y	Y
- Maintenance	Y		N				Y	Y	Y		Y

Source: *Castalia*

In the past, transport policies in many Pacific countries have emphasized construction and the extension of road networks. More recently they have shifted towards a focus on road maintenance to try to curb road degradation, reduce vehicle operating costs and improve overall service reliability. This trend is also reflected in the focus of development bank support and lending<sup>57</sup>.

<sup>53</sup> Samoa road network statistics do not include roads classified as ‘plantation and village roads’. We were not able to obtain a breakdown of road network statistics to this level of detail for other countries. The percentage of paved roads in Timor-Leste is based on information gathered pre-1997 and may no longer be accurate.

<sup>54</sup> Timor-Leste Transport Sector SIP, World Bank, May 2004

<sup>55</sup> “Vanuatu Economic Performance and Challenges Ahead”, ADB Pacific Studies Series, April 2002

<sup>56</sup> Project Completion Report on the Transport Infrastructure Development Project in Papua New Guinea, ADB, December 2002

<sup>57</sup> “In the 1980s, O&M of roads and associated facilities became an important component of Bank-support to the sector. This intervention progressed from strengthening design capabilities of the local institutions in building well-designed roads, financing procurement of required maintenance equipment, providing international consulting services to build up local capabilities in road O&M, and extending support for policy reforms including cost recovery” Special Evaluation Study on the Operation and Maintenance of Road Facilities and their impact on Project Sustainability, ADB, December 1998

Lack of government funding and a shortage of human resources, skills and capabilities are commonly cited reasons for poor road operation and maintenance. Road sector technical assistance projects have helped to increase technical knowledge and skills, but this has been hampered by high staff turnover and low capacity. Low staff salaries, inappropriate staff deployment and a lack of incentives are contributing factors<sup>58</sup>.

Fiji and Samoa have implemented several initiatives to achieve improvements in road operation and maintenance.

*In Fiji:*

- Transport policy emphasis has shifted from road network extension to upgrading, maintenance, and rehabilitation; improvement of operational and management efficiency; and the upgrading of the existing system's safety<sup>59</sup> over the past ten years, although road expansion in rural areas does remain an important focus. The country also has a standing recommendation that road operation and maintenance cycles should be incorporated in all project design work. Planning and management for road maintenance often begins only once the road is built and this initiative helps to identify the institutional and technical requirements for road maintenance from the outset and enables appropriate planning
- The Fijian Public Works Department has introduced private sector involvement to the road sector by contracting out maintenance work. It began contracting out 10 percent of its maintenance work from 1999 and plans to contract out all maintenance work by 2008. Maintenance of both remote and urban roads has been put to tender and have achieved a satisfactory level of interest from private contractors. Overall, road maintenance has improved in the past 5 years, following the introduction of outsourcing<sup>60</sup>
- Strategies to recover cost through road-user charges have been implemented. Network maintenance and administration is covered through the implementation of a road fund through fuel, weight and vehicle tariffs
- Increased focus on road users prompted a merger of the three existing transport regulatory bodies into one transport authority – The Land Transport Authority. The Land Transport Authority is responsible for coordinating public and private road transport, implementing road transport licensing and improving road safety. This September, a new Act will come into effect turning the current Roads Department into a new Department of National Roads, separate from the Ministry of Works. Under this new structure, the Department will have a new commercial focus and will be responsible for managing its own budget and accounting, funded via a dedicated road fund and fuel taxes<sup>61</sup>.

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<sup>58</sup> Special Evaluation Study on the Operation and Maintenance of Road Facilities and their impact on Project Sustainability, ADB, December 1998

<sup>59</sup> Republic of the Fiji Islands 1999 Economic Report, ADB Pacific Studies Series, 1999.

<sup>60</sup> Interview with Ministry of Works, Fiji

<sup>61</sup> Castalia interview with the Ministry of Works in Fiji

*In Samoa:*

- Samoa's Public Works Department has been through significant reforms since 2002. The principle reforms included: significantly reducing staff numbers within the department, outsourcing all road construction and maintenance activities to private operators, and privatizing selected assets. The reforms resulted in the amalgamation of the Public Works Department and the Ministry of Transport, to create the Ministry of Works, Transport and Infrastructure (MWTI) in 2003
- The former Ministry of Works had limited regulatory powers and limited ability to generate revenue. It has also been funded by domestic budget allocations in the past.
- MWTI has outsourced road maintenance and construction services as part of these reforms. Outsourcing has led to the establishment of a number of new private engineering companies, including Samoa Works Engineering which has been awarded the contract for maintenance in Apia<sup>62</sup>
- An increase in fuel charges with an explicit percentage directed to roads, has been recommended as a priority to ensure that the provision of roads can be accounted for on a commercial basis<sup>63</sup>. This has yet to be implemented
- The MWTI incorporates all of the activities of the former Ministries of Transport and Works. It is responsible, through the Transport Control Board, for regulating land public passenger transport activities carried out by the private sector. The Transport Control Board generates sufficient revenue from vehicle inspection and licensing activities and funding for any expenditure is allocated to this area from the Government budget. It is not yet clear how much the recent shift to increased outsourcing will impact the cost of undertaking road construction and maintenance work, but costs are reputed to be more explicit under this new model<sup>64</sup>
- Since road sector reforms have only recently been introduced in Samoa, there is little statistics evidence to support a 'before and after' comparison. However, anecdotal evidence suggests that outsourcing has resulted in improved efficiency and more responsive asset management services<sup>65</sup>.

These experiences highlight some key drivers of success including:

- Establishing policies which recognize the importance of road operation and maintenance
- Linking maintenance with road design contracts
- Contracting out maintenance work to the private sector
- Implementing road user charges
- Creating a single transport authority.

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<sup>62</sup> Samoa Transport Sector Review, Draft Final Report, World Bank 2004

<sup>63</sup> Ibid

<sup>64</sup> Ibid

<sup>65</sup> Ibid



Other Pacific countries (Vanuatu and Marshall Islands) have undergone a similar policy shift. In Vanuatu, several road construction projects have been under-taken in the past five years without adequate economic justification. The result is that many of these roads are unlikely to result in the expected economic or social return on investment, while much needed upgrades for major urban roads in Port Vila and Luganville have been slow<sup>66</sup>.

In countries like Papua New Guinea where the road network is still fragmented and sparse, operation and maintenance is still critical, but road construction remains equally important.

### ***Contracting***

Road maintenance contracts are traditionally designed on a per unit basis for a short term assignment, rather than on the quality of output<sup>67</sup>. For example, contractors are paid per pothole fixed in a road, per kilometer of litter removal or lane striping or per hour worked on a particular stretch of road. When paid on this basis, it is in the best interests of the contractor if there are more potholes to fix, for example. They therefore have less incentive to do quality work and contract supervision processes are often not adequate to ensure quality.

Internationally, performance based contracts have become more common. Under performance based contracts, success is defined by the achievement of certain minimum performance standards. Payment is based on achievement at different milestones with bonus rewards for good performance and penalties for poor performance. In this scenario, the risk is transferred to the contractor.

Long term performance based contracts have been used with some success in New Zealand where almost all roadwork has been outsourced in the past ten years. The New Zealand government has developed a 10-year maintenance contract called a “performance specified management contract”. Under this contract, the contractor takes total responsibility for delivering pre-agreed service levels. Regular audits are carried out to determine compliance. These contracts have amounted to savings of around 20% and have substantially improved services<sup>68</sup>.

Outsourcing may not work for all road sectors in Pacific countries. The experience in Vanuatu has been that private contractors are reluctant to maintain remote roads<sup>69</sup>. This could suggest that private sector involvement may not be possible in some of the smaller, more dispersed Pacific Islands and in remote areas of bigger countries. However, the Ministry of Works in Fiji noted that private contractors are just as interested in tendering for the maintenance of remote roads, as they have been for primary highways. If there is a lack of interest in remote and rural roads, the solution may be to increase the value and profitability of these contracts and impose penalties for not doing this work to a certain standard. This may be more attractive to private operators, while safeguarding a certain standard of work.

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<sup>66</sup> Vanuatu Infrastructure Master Plan Development Framework, Republic of Vanuatu, February 2002

<sup>67</sup> “Contracting for Road and Highway Maintenance” Reason Public Policy Institute, March 2003. Interviews with Ministries of Works in Fiji and Samoa confirmed that this is the basis on which outsourcing occurs

<sup>68</sup> “In the last 11 years the actual maintenance cost has remained nearly the same in real dollars, yet traffic volumes have increased by 52% and accident rates have decreased by 45%” Robin Dunlap of Transit New Zealand quoted in Contracting for Road and Highway Maintenance” Reason Public Policy Institute, March 2003

<sup>69</sup> Vanuatu Infrastructure Master Plan Development Framework, Republic of Vanuatu, February 2002

Many Pacific countries already outsource the construction of new roads. These contracts include a post-construction maintenance period. This period is normally up to a year<sup>70</sup>. Countries could consider extending this period to help to reduce the maintenance burden on governments and provide incentives for durable construction.

### ***Regulation and Enforcement for Road Operations***

Studies and anecdotal evidence suggests that heavy vehicle overloading is a recurrent problem in many Pacific countries. Reasons for this problem include ineffective law enforcement, lack of vehicle inspection facilities and irresponsible driver behavior.

Policies to address heavy vehicle overloading, traffic regulations and enforcement are as important as road maintenance. Fiji has implemented a number of initiatives to reduce overloading. The Government plans to install weighing stations at 18 sites with ADB funding, and has set up a Traffic and Road Safety Unit under a technical assistance project to identify and address all road safety and traffic management issues. Despite this, overloading remains a problem, and under existing road use charging systems, there is a low level of cost recovery for medium and heavy trucks relative to the damage caused to road pavements<sup>71</sup>.

Overloading is an issue in other Pacific countries as well. In the Marshall Islands, proposals have been made to introduce a 'road damage charge' on heavy vehicles based on their laden axle weight, but this has yet to be implemented as it has not found favor with many road users. This concept is similar to that of the weighbridges in Fiji and is common policy in other countries like New Zealand and the USA.

### ***Cost Recovery and Commercial Autonomy***

In addition to outsourcing, road departments could benefit further from an increased commercial focus. This can be achieved by corporatizing the road department, and giving it control of its own budget and accounting, such as is being proposed for Fiji. Under this model, the road authority must be allowed to recover the costs of operation through vehicle licensing and registration, fuel taxes, vehicle loading charges. Countries that have a low road user base due to low vehicle numbers may not be able to cover the total maintenance costs in this way. Governments in these countries may need to continue to provide a subsidy for road maintenance from the domestic budget. These subsidies should be made explicit and the road authority or department and contractors made accountable for quality of service under the subsidy.

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<sup>70</sup> Castalia interviews with Ministries of Works in Fiji, Kiribati and Samoa

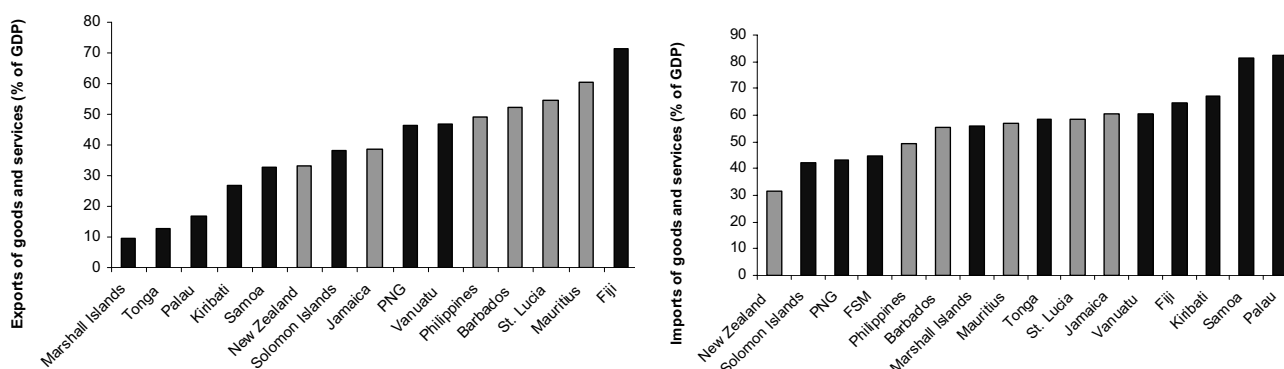
<sup>71</sup> Republic of the Fiji Islands 1999 Economic Report, ADB Pacific Studies Series, 1999.

## A.6 Ports and Maritime Services Sector Analysis

Pacific countries rely on ports and shipping for imports, exports, domestic and regional transport of goods and passengers. Improved productivity and efficiency in port operations results in lower import costs and higher export returns. This has a positive effect on the countries' economies.

Exports account for a high proportion of the Fiji economy at around 70%, but represent only 40% of GDP or less for most other Pacific countries. This is lower than most comparator countries. Imports account for over 50% of GDP in most Pacific countries and over 80% in Samoa and Palau. This is significantly higher than in New Zealand, where imports account for around 30% of GDP. To illustrate the importance of trade – much of it maritime – Figure A.28 compares the goods imported and exported as a percentage of GDP in Pacific and comparator countries.

**Figure A.28: Goods Imported and Exported as a percentage of GDP**



Source: WDI Indicators

Notes: PNG: Papua New Guinea, FSM: Federated States of Micronesia

### A.1.6 Shipping Patterns In the Pacific

Figure A.29 demonstrates the major shipping patterns within the Pacific Region. They are:

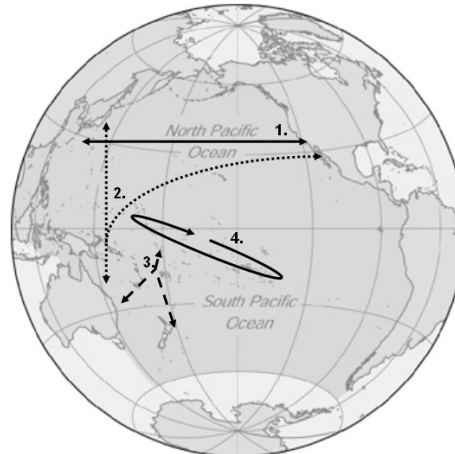
1. East-West services between Asia, North America and Europe. Large container ships of over 5000 TEUs<sup>72</sup>, which make up a large proportion of this traffic do not call at the Pacific Island ports
2. North-South services between Australia, New Zealand, North America and North East Asia are operated by ships of between 1800 and 2200 TEUs and do call at some Pacific Island ports
3. Intra-regional shipping services provide routes between Australia, New Zealand and various Pacific countries

<sup>72</sup> TEU stands for “Twenty Foot Equivalent Unit”. This is the standard size for a single container.

- Domestic and Pacific Island services operate between Pacific Island countries and between islands within each country.

**Figure A.29: Major Shipping Patterns in the Pacific**

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There is currently very little transshipment business at Pacific ports. This contrasts with Mauritius, Jamaica and other Caribbean countries, which have developed significant transshipment business.

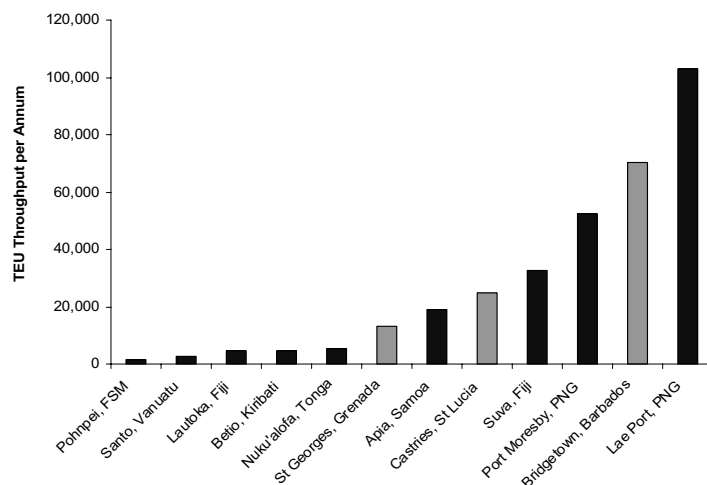
#### **A.2.6 Benchmarking**

This section benchmarks the performance of Pacific Islands and comparator countries against a set of standard operating indicators.

##### ***Size of Ports***

We have measured the size of Pacific ports by volume of cargo handled. Figure A.30 compares the TEU throughput per annum at selected ports in the Pacific and comparator countries.

**Figure A.30: TEU Throughput per annum**

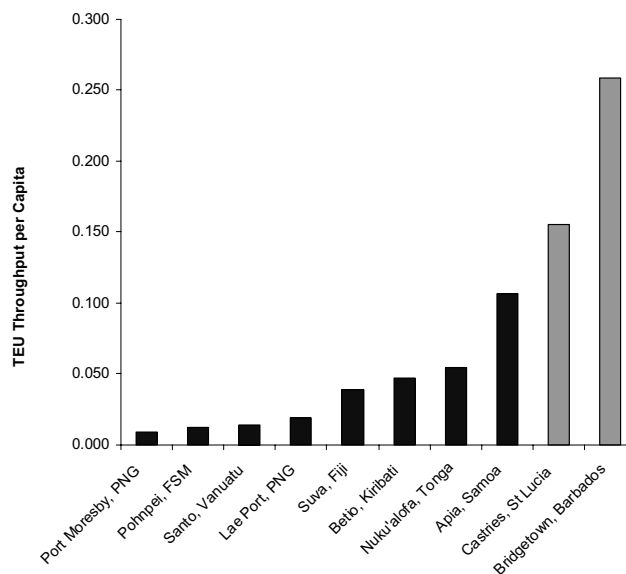


*Source: St Lucia, Barbados: ECLAC (2003), Fiji: ADB (2000), Vanuatu: ADB (2001), Kiribati, FSM, Samoa, PNG, Tonga (2003 figures, based on questionnaires)*

Lae, Port Moresby and Suva ports are the largest of the Pacific ports, and comparable with Bridgetown, Barbados. They are significantly smaller than the port in Kingston, Jamaica (not shown on this graph) which is one of the largest ports in the Caribbean region. In 2003 Kingston port handled over 1.1 million TEU. Apia, Samoa and Suva, Fiji are comparable with Castries, St Lucia and St Georges Grenada.

Another way to evaluate port usage is to compare TEU throughput levels as they relate to the size of the country's population. Figure A.31 compares TEU throughput per capita. Apia port in Samoa handles a relatively high proportion of container traffic given the total population size. The remaining Pacific ports are small when compared with the countries' total population.

**Figure A.31: TEU Throughput Levels per capita**



*Source: TEU throughput data as per Figure A.30.. Population data from WDI indicators for same years as TEU throughput*

### *Efficiency*

Aside from the TEU throughput data shown in above, publicly available performance data for ports is extremely limited, and we have been unable to construct meaningful indicators. In addition, comparator ports have shore-based container crane, while Pacific ports do not, relying instead on slower ship lifting gear, so comparisons on cargo handling productivity rates are not meaningful.

While smaller ports, such as those in Federated States of Micronesia and Kiribati may not have the throughput volumes to justify installing shore based cranes, it is surprising that larger ports like those in Papua New Guinea, Suva and even Apia do not have this superstructure in place. Their TEU throughput volumes are at least as high as the comparator ports of St Lucia and Barbados which do have container cranes. Investing in a container crane would help to improve port efficiency levels and would therefore help to encourage more traffic. This would also help to establish these ports as Pacific region ‘mini-transshipment hubs’, a goal identified by both the Samoa and Fiji port authorities.

Operational efficiency at Pacific ports is constrained by outdated design and equipment<sup>73</sup>. This problem is compounded by poor maintenance. Capital city wharves serving coastal and inter-island trade are “cramped, lack adequate cargo sheds and passenger handling facilities, possess little or nothing in the way of cargo handling facilities and are poorly maintained.”<sup>74</sup>. We provide detailed descriptions of efficiency at some Pacific ports below:

<sup>73</sup> The AusAid Pacific Regional Transport Study notes that many of the port facilities in the Pacific were built prior to containerization. Existing assets are not conducive to improved port efficiency. (AusAid, June 2004)

<sup>74</sup> “Pacific Regional Transport Study – Final Report Volume 1”, June 2004

### *Suva Port, Fiji*<sup>75</sup>

Suva Port is the main port for international container trade in Fiji. It is also the focal point of domestic services to outer islands, fishing and ship repair services. The port handles 69% of all ship calls in Fiji. Container traffic makes up the majority of cargo operations and has increased over the past 20 years. The existing wharf cannot support the weight of containers and lifting equipment so trucks are required to help transfer containers to storage. Although the existing yard space is adequate for current TEU volumes, it is estimated that this will not be the case after 2011, when the total yard capacity of 50,000 TEU per annum will be reached.

Ships serving Suva must have their own lifting gear as the port has no shore-based lifting cranes. Cargo handling productivity improved from 5.23 containers per vessel-hour in 1998 to 8 containers per vessel hour using the ships' lifting gear. The requirement for ships to carry lifting gear does not impact intra-regional traffic as this is a requirement for other Pacific ports. However, it does constrain the number of calls from ships on international routes as many of these would only need the gear for Suva.

Cargo handling at Suva port is also inefficient and the state of cargo handling equipment poor<sup>76</sup>. This affects ship productivity and in turn affects freight costs. Overall, this contributes to fewer ships calling and hence reduces the competitiveness of the port.

### *Port Vila and Santo Port, Vanuatu*<sup>77</sup>

Port Vila is the major port in Vanuatu. It handles around 70% of all imports and 30% of all exports (by tonnage). It has recently been overhauled through the ADB-funded Urban Infrastructure project to extend the wharf's working life by another 20 years. Although over 80% of cargo is containerized, Port Vila has inadequate container handling facilities. This restricts the ability of the port to encourage more foreign vessels and operators on inter-island routes.

Santo port handles the remainder of the overseas traffic in Vanuatu and serves as an international collection point for northern islands. It has recently undergone a complete rehabilitation to overcome serious degradation and lack of maintenance. The renovations have significantly improved the port's performance. The average ship turnaround time has been reduced from a level of 2.2 (in 1996) to 1.1 (in 2001) days per ship, overall ship waiting time has been reduced to almost zero, from 15.5 days in 1990 and 8.3 days in 1991. The total number of vessels calling at Santo increased from 66 in 1998 to 85 in 2001.

### *Betio Port, Kiribati*<sup>78</sup>

Betio port in Tarawa is the primary commercial port in Kiribati, the only gateway for foreign trade and the centre of domestic sea transport. Large ships cannot berth alongside the quay wall and containers are transferred between ship and shore using barges and tugs. This

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<sup>75</sup> "Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Maritime and Ports Authority of Fiji for the Fiji Ports Development Project in the Republic of the Fiji Islands", ADB, January 2002

<sup>76</sup> Ibid

<sup>77</sup> Sources: "Vanuatu Infrastructure Masterplan" Republic of Vanuatu, 2002, "Vanuatu: Economic Performance and Challenges Ahead" ADB Pacific Studies Series, 2002 and "Santo Port Project Performance Audit Report" ADB, May 2002

<sup>78</sup> Sources: "Review of Maritime Transport 2000: Chapter V Port Development" United Nations, 2000

system reduces cargo handling efficiency. The number of containers handled per hour is half the level of containers handled ports with good container crane operations.

*Dili Port, Timor-Leste*<sup>79</sup>

Work is currently underway to reconstruct and convert Dili port into an international port handling container cargo. Some of the existing infrastructure is over 40 years old and has been poorly maintained. It is estimated that in the future, operations at Dili port will be congested due to capacity constraints and proposals have been made to develop a new cargo port at Tibar to the west of Dili.

**Security**

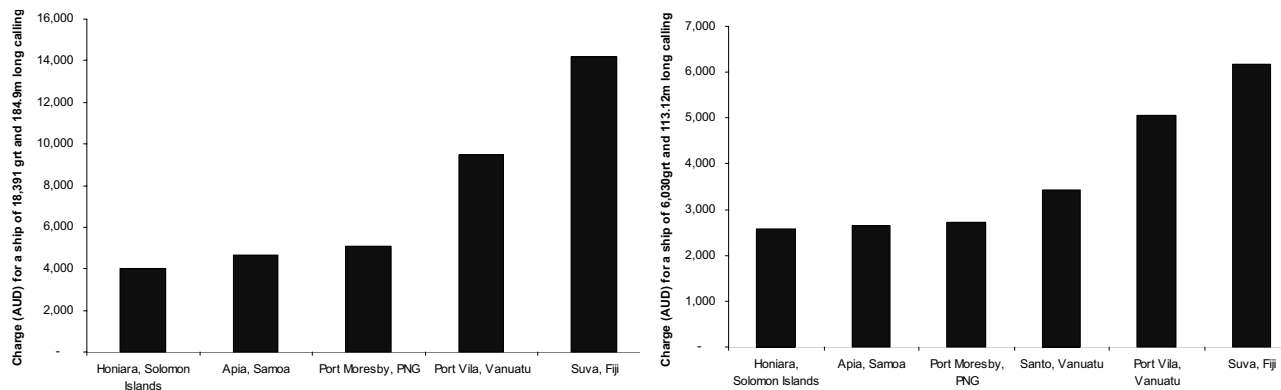
A number of new codes and practices have been introduced recently, of which the most significant for Pacific ports is the International Marine Organization’s (IMO) International Ship and Port Facility Security Code (ISPS). Samoa, Pohnpei, Port Vila and Betio Port in Kiribati all reported that ISPS requirements have already been met. Despite the significant costs (especially for smaller ports like Betio), this suggests that most ports are meeting these requirements because losing the shipping traffic is simply not an option.

Other security requirements include the US Maritime Transport Security Act (2002) which allows for the US to assess security at foreign ports, and the US Customs and Border Protection’s Container Security Initiative (CSI), which provides for export country container security measures. Under the CSI, restrictions can be imposed on, or entry denied to, vessels with cargo from ports that do not have effective anti-terrorist measures. Ports that export goods to the US or export goods on US-bound ships have to comply with these Acts.

**Port Charges**

Figure A.32 compares tariffs at selected Pacific ports for a vessel of 18,391 gross registered tons and 184.9m and 6,030 gross registered tons and 113.2m calling.

**Figure A.32: Comparison of Port Charges**



*Source: Pacific Regional Transport Study 2004*

<sup>79</sup> Sources: “Transport Sector Masterplan for East Timor” ADB, May 2002 and “World Bank Transport Sector Investment Plan for Timor-Leste”, May 2004

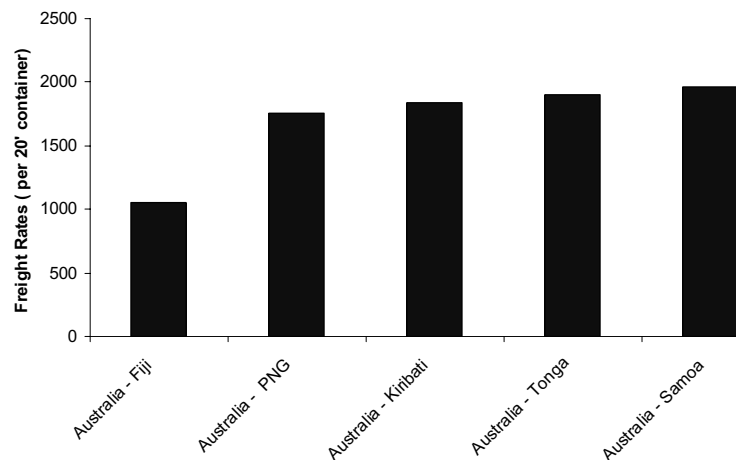


Port charges vary significantly within the region. Suva, Fiji has consistently higher charges, followed by Port Vila in Vanuatu. Apia, Samoa and Honiara in the Solomon Islands have the lowest charges of these ports, followed by Port Moresby in Papua New Guinea. It is significant that in both Apia and Port Moresby port services (such as stevedoring) are provided on a competitive basis. In Papua New Guinea there is also competition between ports. By comparison, Suva port contracts out stevedoring services to a government owned monopoly provider. This suggests that the competition contributes towards lower port charges and greater service efficiency.

### ***Freight Rates***

Freight rates are more significant than port charges in the total cost of maritime trade.

**Figure A.33: Comparison of Freight Rates**



*Source: Pacific Regional Transport Study, Aus.Aid 2004*

Comments from the recent Pacific Regional Transport Study of relevance to this section are:

- Freight rates to and from many of the Pacific countries appear higher than rates charged on main line trades
- The cost of shipping services to these countries is high due to: long distances between ports of call, small scale of cargo flows, trade imbalances with high container repositioning costs and the need to employ relatively expensive geared vessels
- Rates to and from Fiji are lower than rates to and from other Pacific countries such as Tonga, Samoa, Kiribati and Nauru. This can be partly explained by Fiji's relatively high trade volume and relative balance of trade. In addition, the higher volume of cargo shipped to and from Fiji attracts calls by a larger number of container operators creating a more competitive environment. The route from Australia to Fiji is highly competitive. It also has the lowest freight rates.

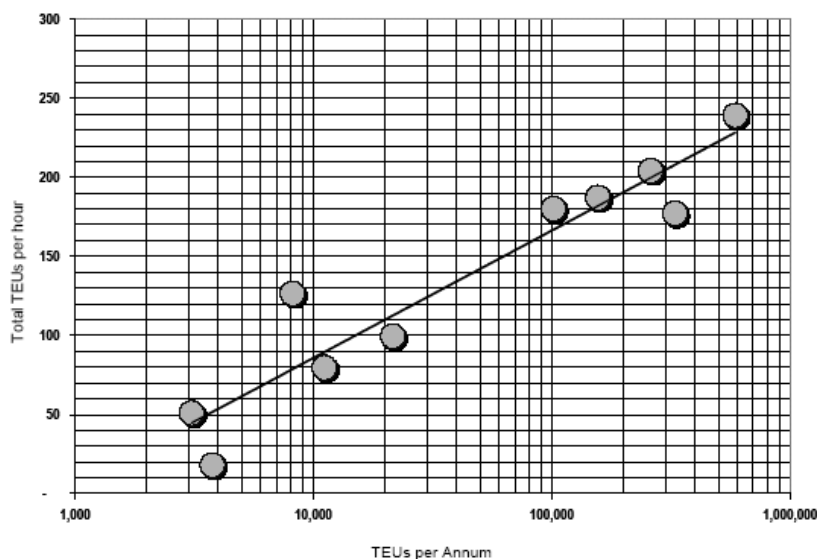
### *Economies of Scale*

Port operations such as cargo handling services have been shown to have increasing returns to scale<sup>80</sup>. Figure A.34 which plots data for a selection of (anonymous) Latin American ports demonstrates that economies of scale do exist.

The chart shows the number of TEUs processed per hour increases in direct proportion to the total number of TEUs processed per year. More specifically: larger vessels have lower costs per container than smaller vessels. Large vessels also require bigger ports and equipment. Larger ports also employ bigger cranes and other equipment which have greater throughput. They are able to make more intensive use of the port assets and can also achieve economies of scale in the management of port operations.

The main commercial ports in the Pacific are significantly smaller than most of the comparators and have had limited access to funding for upgrades equipment and maintenance. Most port infrastructure in the region has been funded by donor grants<sup>81</sup>. The low volume of traffic at some of the smaller Pacific ports means that any investment in port infrastructure produces a relatively low rate of return. The low rate of return is a deterrent to investment. Kiribati provides one example of this where economic analysis of a development plan to construct a new wharf allowing alongside berthing of 90% of the ships calling, was shown to provide a low rate of return because of the small cargo volumes compared with the large capital investment required to bring the facilities up to an international standard<sup>82</sup>.

**Figure A.34: Central American Ports, Throughput and Movements 1999**



Source: Hoffman (2001) Grafico 4 in *Caribbean Infrastructure Review*, Castalia 2004

<sup>80</sup> “Caribbean Infrastructure Review”, Ports and Maritime Services Section, Castalia, June 2004

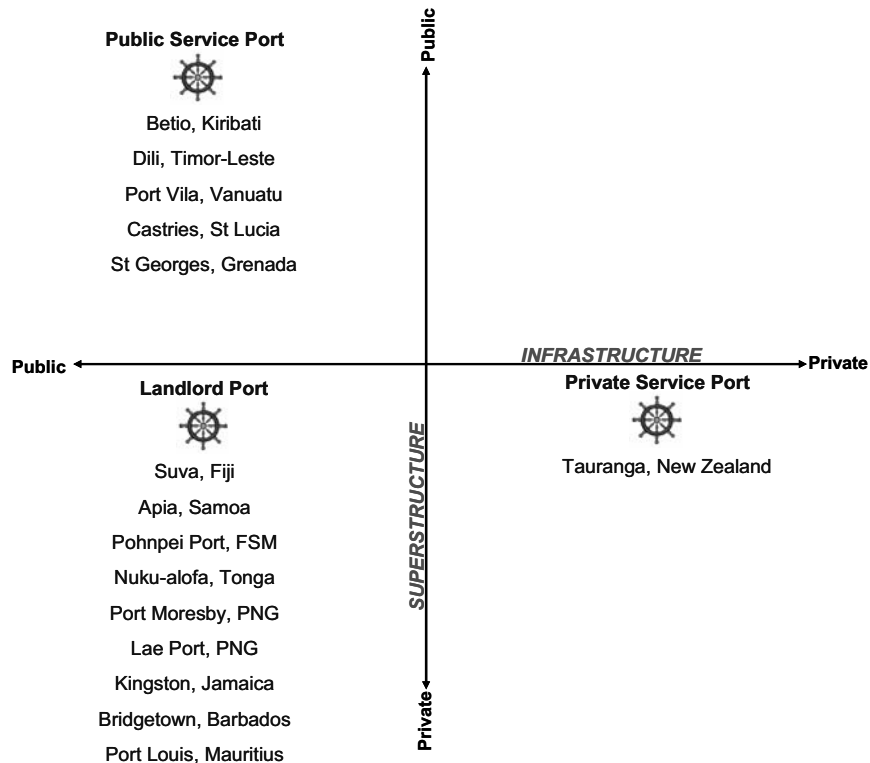
<sup>81</sup> Pacific Regional Transport Study, AusAid, 2004

<sup>82</sup> “Review of Maritime Transport 2000”, Chapter V Port Development, United Nations, 2000

### A.3.6 Institutional Analysis

Figure A.35 illustrates the institutional arrangements in Pacific and comparator ports. Many ports in developing countries are managed under the ‘Public Service Port’ model.

**Figure A.35: Institutional Arrangements in Pacific and Comparator Ports**



Source: Various, Castalia Research  
 PNG: Papua New Guinea, FSM: Federated States of Micronesia

Under the Public Service model, the Government Port Authority owns, maintains and operates all assets, and all cargo handling is carried out by Port Authority employed labor. This arrangement often leads to inefficiency due to a lack of internal competition and a lack of user or market orientation. This structure also leaves the port vulnerable to political influence due to its dependence on the government budget.<sup>83</sup>

Alternative models include the Landlord Model and the Private Service Port Model. Under the landlord model, the Port Authority acts as a landlord, regulating port operations carried out by private operators. Under this model, infrastructure is often leased to private operators who also provide and maintain their own superstructure. Port labor is employed by the private terminal operators.

Under the private service port model, port land is privately owned and infrastructure, superstructure and labor are privately owned and operated. Some of these ports are self-regulating.

<sup>83</sup> World Bank Ports Toolkit, Module 3

The landlord model is the most commonly recommended model for port operation and has been successful in Samoa as well as the Caribbean and Mauritius. In this model, a number of private operators are employed on contract to the port authority to provide specialist services.

Apia Port in Samoa and Lae and Port Moresby in Papua New Guinea have some of the highest TEU throughput rates. They also have relatively low port charges. All of these ports are profitable.

While the performance of Papua New Guinea's ports could be explained by the fact that it is close to and a natural hub between Australia and other parts of Asia, it is significant that both here, and in Samoa ports are based on the landlord model, under which the private sector competes to provide port services. Additionally, in Papua New Guinea there is competition between ports.

Contracting out various port services to different operators may not be appropriate for small ports like Betio in Kiribati, since the port has such a low level of traffic it is not likely to generate sufficient competition. In these ports it may make more sense for the government to contract out all superstructure services to a single entity on a concession basis to improve efficiency.

Table A.6 provides a detailed overview of institutional arrangements in selected ports and shipping services. Detailed information on selected ports follows.

**Table A.6: Institutional Indicators in the Maritime Services Sector**

Maritime Services	Suva, Fiji	Apia, Samoa	Betio, Kiribati	Dili, Timor-Leste	Port Vila, Vanuatu	Lae Port and Port Moresby, Papua New Guinea	Nuku'alofa Port, Tonga	Pohnpei Port Authority, FSM
Specific Legislation	Y	Y	Y	N	Y	Y	Y	Y
Independent Regulator	Y	N	N	N	N	Y	Y	N
Statutory Corporation	N	Y	Y	N	N	Y	Y	Y
Independent Board	N	Y	Y	N	N	Y	Y	Y
Private ownership: Infrastructure	N	N	N	N	N	Y	N	N
Private ownership: Superstructure	N	Y	N	N	N	N	Y	Y
Private operation:								
- Port infrastructure	N	Y	N	N	N	Y	N	N
- Superstructure	N	Y	N	N	N	N	Y	Y
- Stevedoring	Y	Y	N	Y	Y	Y	Y	Y
- Pilotage	Y	N	N	N	N	Y	N	Y
- Towing	Y	Y	N	N	N	Y	N	Y
-Dredging		N	N	N	N	N	N	Y
-Other	Y	N	N	N	Y	-	Y	Y
Competition within port services?	N	Y	N	N	N	Y	N	N
Competition between ports	N	N	N	N	N	Y	N	N
Is the port profitable?		Y	Y	Y	Y	Y	Y	Y

## *Fiji*<sup>84</sup>

### *Ports*

The Maritime and Ports Authority of Fiji (MPAF) is responsible for the administration of the country's main ports, Suva, Lautoka and Levuka. MPAF is a commercial statutory authority. Its responsibilities include port management, development, port and maritime regulation, and licensing.

A government-owned company Ports Terminal Limited (PTL) manages the stevedoring, cargo handling, pilotage and warehousing activities on behalf of the Government under a five year non-exclusive license agreement, for which it pays MPAF an annual rental fee. PTL was created to facilitate commercialization and privatization of port operations and to enable it to compete with private businesses. This dilutes the effectiveness of the outsourcing model as there are fewer incentives to operate efficiently and cost effectively when there is no competition for these services. This is one possible explanation for the highest port charges in Fiji. Plans were developed in the 1990s to sell PTL to private investors, but as a result of political upheavals, the sale did not take place.

It was envisaged that MPAF would regulate the ports industry and PTL would focus on commercial operations, but in practice separation of function did not occur and the two entities had overlapping roles. The Fijian Government has recently approved a restructure of the Maritime Authority of Fiji and Ports Terminal Limited. A new company, Ports Terminal Corporation Limited (PTCL) will take on all commercial functions and the existing Fiji Islands Maritime Services Authority will be responsible for all regulatory functions<sup>85</sup>. Only half of the existing 172 staff will be required to run the new company. Extension work on the new Suva port will begin once the new company is established.

### *Shipping*

The Government also has a 49% shareholding in Shipbuilding Fiji Limited which operates shipyards and slipways at Suva. Some private wharves exist at Savusavu and Malau.

Fiji is served by a mixture of public and private shipping services. Private companies serve inter-island routes and the government fleet provides services to all government departments e.g. transporting machinery, materials, supplies, officials and vehicles. The Marine Department is responsible for regulation in accordance with the Marine Act (1986). The Prices and Incomes Board within the Ministry of Finance sets inter-island freight rates. Passenger fares are not subject to price controls.

The main island routes are open to competition and in 1997 a franchising scheme was introduced for outer islands shipping where competition is limited. Under this scheme, the Government defined a minimum service level for shipping to inadequately served areas and specified maximum freight rates in the franchise tender documents. Operators submitted tenders on the basis of the subsidy they required to operate these services. The service provider requiring the least subsidy got the contract.

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<sup>84</sup> Republic of the Fiji Islands 1999 Economic Report, ADB Pacific Studies Series, 1999 and "Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Maritime and Ports Authority of Fiji for the Fiji Ports Development Project in the Republic of the Fiji Islands", ADB, January 2002

<sup>85</sup> "Major staff cut part of Ports' restructure" Fiji Islands Business, July 2004

A Fiji Government review in 2002 found that the shipping franchise scheme implemented to provide shipping services to remote outer islands had not fully achieved its objectives. Meyrick and Associates conducted a feasibility study to establish whether a Government Shipping Corporation was the best way to improve the services. The analysis showed that while there was widespread support for the scheme, some islands were dissatisfied with service levels and performance, and contract agreements were seen as inflexible. The study concluded that a 'non-vessel operating Government Shipping Corporation' was feasible and could over time, reduce subsidies through trade growth. Under this model, the 'non-vessel operating Government Shipping Corporation' would deliver services by contracting private operators.

The Fijian Government has subsequently announced its intention to set up a Government Shipping Corporation for this purpose<sup>86</sup>. This recommendation has been accepted and is currently being implemented.

*Samoa*<sup>87</sup>

*Ports*

The Samoa Port Authority (SPA) was created by an independent act of legislation in July 1999. It was set up as a pilot profit-making commercial organization to see whether or not the self-funding model would be successful.

Prior to corporatization, the Ministry of Transport managed all port activities. All revenue was collected into a central Treasury fund and an operating budget was allocated annually. Budget allocations proved to be insufficient to cover operating and maintenance costs, let alone enabling the port to embark on capital works projects. By 1999 the port was operating at a loss.

Corporatization has been successful: Since 1999, the SPA has doubled its growth, improved contained storage facilities and successfully achieved compliance with the IMO-ISPS security codes prior to the 1 July deadline this year. It has run at a profit every year since 1999 and pays the government a dividend. The SPA subsidizes domestic ports in Samoa out of its profits. The government pays no subsidy to the SPA.

The General Manager credits the SPA's success to the organization's focus on being 'a facilitator'. Operating under the landlord model, the SPA has outsourced most port services, like stevedoring and cargo delivery, to the private sector. Competition between private operators in the clearing and forwarding business has resulted in efficient service provision and better customer service. Private operators are responsible for buying all of the superstructure equipment (e.g. forklifts) and the SPA is therefore able to channel profits back into port improvements.

Under the Act, the SPA does not require Cabinet approval for tariff increases, but is required to publish any increase before it takes effect. Since its inception in 1999, the SPA has implemented one tariff increase. The SPA has focused on finding new sources of income to cross-subsidize the operation costs, rather than continue to increase tariffs. One initiative has been to dredge the harbor and sell the sand for profit.

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<sup>86</sup> <http://www.meyrick.com.au/html/Projects/RecentProjects.htm#FijiTransportPolicy>

<sup>87</sup> Sources: Castalia Interview with Samoa Port Authority September 2004, "Ryan's recipe for Samoa Ports Authority's success" Fiji Islands Business, August 2004

Apia Port has become one of the best performing ports in the Pacific and aims to develop itself as a 'mini-transshipment hub' for the region. It currently handles around 1500 containers in transshipment traffic per annum.

### *Shipping*

The Samoa Shipping Corporation Limited is responsible for inter-island shipping services. It is a government owned corporation. It has four vessels, of which two were funded by the Japan International Cooperation Agency through aid to Treasury, and leased to the Shipping Corporation. Aside from a commercial operator which provides a ferry service, the Samoa Shipping Corporation has no competition for services. This is partly due to small scale. Nevertheless, services are adequate.

#### Box A.9: Mauritius Port

Mauritius is a small island nation, similar to many Pacific countries. Its port previously had a purely local role, but with reform and a goal to increase "non-captive" traffic, has grown sharply.

Mauritius expanded its port at Port Louis through a 1989 development plan. In 1996 – 2001 it undertook a project to restructure the port, in conjunction with the World Bank. This restricted the role of the Mauritius Port Authority to a landlord port, owning land, buildings, superstructure and quay cranes, and working through competitive concession contracts. The major concessionaire is the Cargo Handling Corporation Ltd, still a publicly owned body, although the port authority is no longer a shareholder. A private shareholding is possible in future.

The CHC has substantially improved efficiency and costs, with fewer staff, new working hours, labor flexibility and productivity. Crane productivity has been up to 19 moves per hour, which is a reasonably good figure internationally, although it is currently less through congestion.

There has been significant growth in traffic through the port. It handled 5m tons in 2002-03, up 11% on the previous year. Containers, 38% of the traffic, were up 50% on the previous year. Transshipment traffic grew even faster, by 625%, up from 10,174 TEU to 73,389 in a year. In 2001 it was only 3,874 TEU. This growth is continuing: by the end of December 2003, the transshipment traffic was 102,282 TEU. About half of all container throughputs are now transshipment traffic.

Container traffic, in terms of total TEU handled, is 246,699, but total throughput is 318,553 (counting both in and out legs of transshipment legs). In 1992, before the productivity improvements, and before the development of transshipment, only 80,000 TEU were handled. This growth is such that it is outstripping the capacity of the expansion plan. Vessel waiting time has increased to 24 hours. A new plan is being developed.

Two new container cranes are being acquired, but by lease rather than purchase, in explicit recognition of the volatility and risk involved in the transshipment business.

Improving port productivity has borne fruit: three major shipping lines are now using Port Louis as a transshipment hub – Maersk – Sealand; Mediterranean Shipping Co; and P&O Nedlloyd/Mitsui. Transshipment trade attracts a significant discount on port charges. Some transshipment is for regional ports (e.g. on Madagascar and Reunion), but it is also between intersecting trade lanes: between Africa – Mediterranean – Europe services, and services to Australia and New Zealand, and between Asia, South Africa, and South America. Mauritius has seen the potential in its location and built an export product around it.

*Source: Castalia*



Vanuatu<sup>88</sup>

*Ports*

The Department of Ports and Harbors is responsible for management and operation of the Port Vila and Santo Ports. It is also responsible for shipping and ports administration. Legislation, control of shipping, safety inspections and surveys are the responsibility of the Vanuatu Maritime Authority which was established in 1999. This was a major departure from traditional government policy, and has resulted in improved regulation and safety<sup>89</sup>.

The Vanuatu Infrastructure Masterplan (2002) notes that the Department of Ports and Harbors is understaffed and in need of strengthening, but that it is unlikely “that any strengthening of the current institution will take place” due to a lack of Government and donor funds.

BoxA.10: Vanuatu Maritime Services: Private Sector Involvement and Accountability in Shipping

**Vanuatu Maritime Services is a profit-making venture with headquarters in Port Vila but operating from a New York branch under contract to the Vanuatu Maritime Authority, which administers the licensing of vessels to carry the Vanuatu flag. The reason that owners find the Vanuatu flag desirable is because the country is known for its safety standards and ships over 20 years old do not get registered. Because of this, Vanuatu flagged vessels are less likely to be detained for inspection in foreign ports.**

**This arrangement has been lucrative for both Vanuatu and the private company. The annual income earned by Vanuatu since operations began, and passed over in monthly installments by Vanuatu Maritime Services, has increased from around \$US450,000 to \$720,000 per annum.**

**This success has not occurred without controversy. The dearth of roles for Ni-Vanuatu in the company and concerns about the division of profits has resulted in political debate. In 2002, the Auditor General tracked the monies received by Vanuatu Maritime Services and paid to the Vanuatu Maritime Authority and prepared a report which confirmed that all monies remitted by Vanuatu Maritime Services have been received by the Maritime Participation and Investigation Fund (MPIF), but that some of the monies spent by the MPIF may not have been disbursed in accordance with Maritime Regulation.**

**The report concluded that there was a high level of control of banking, collection and revenue recording within the private company, but that there is less clarity as to how these funds are disbursed by the authorities within Vanuatu. For example, by law MPIF is required to spend a proportion of monies received from Vanuatu Maritime Services on supporting the training of Ni-Vanuatu through helping to fund the Vanuatu Maritime College in Santo and it is unclear as to whether or not this requirement is consistently met. This highlights the importance of transparency and accountability in the application of monies received by these institutions in order to safeguard the intended benefits for all.**

**Source: “Vanuatu International Shipping Registry: High Water Mark” Port Vila Presse, 15<sup>th</sup> December 2003, “Auditor General clears Vanuatu Maritime Services” Port Vila Presse, 7<sup>th</sup> July 2003 and Castalia Research**

<sup>88</sup> Sources: “Vanuatu Infrastructure Masterplan” Republic of Vanuatu, 2002, “Vanuatu: Economic Performance and Challenges Ahead” ADB Pacific Studies Series, 2002 and “Santo Port Project Performance Audit Report” ADB, May 2002

<sup>89</sup> “Regulation and maritime safety has improved with the establishment of the Vanuatu Maritime Authority” pp266 “Vanuatu: Economic Performance and Challenges Ahead” ADB Pacific Studies Series, 2002

## *Kiribati*<sup>90</sup>

### *Ports*

The Kiribati Port Authority was corporatized in 2000 under the Kiribati Ports Act. As a commercial entity, the Port Authority is responsible for operating its own budget. Any profit goes to acquisition and upkeep of assets in return for a government dividend. The Port Authority has not paid any dividends to date while it has been building up its assets.

Corporatization has allowed the Port Authority to focus on “cutting costs and running more efficiently”. The Government retains control of all port assets which the Port Authority operates and maintains. Betio Port is currently running at a profit and is able to cover costs with existing charges. The Port Authority is currently reviewing options for contracting out selected services to cut expenses further.

Betio Port is limited by the fact that ships cannot dock quayside due to the shallowness of the lagoon. Ships must anchor at sea and barges are used to collect containers. Although there is no waiting time for ships and clearing begins within an hour of berthing, this arrangement means that it takes an average of two days to process each vessel. A study recently reviewed the possibilities for upgrading the port to allow vessels to dock quayside. This proposal is currently being evaluated by the Kiribati Ministry of Transport. If it is approved, it would significantly improve the ability of the port to process vessels and would dispense with the additional expenses involved in running the tugs and barges. This would reduce freight costs in turn and would therefore help to attract more traffic to the port. However the economic analysis of the project suggests the benefit-cost ratio might be lower than one might wish.

### *Shipping*

Chief Container Service provides international services between Australia (Sydney, Brisbane and Melbourne) and Tarawa. It is the sole operator on these routes. Previously, a competing operator, Sofrana Lines entered the market in competition to Chief Container Services, which responded by lowering its prices and improving service to the extent that Sofrana withdrew<sup>91</sup>.

Kiribati's domestic shipping services to outer islands are mainly provided by a government owned company Kiribati Shipping Services Limited (KSSL), while private sector operators provide services to the country's inner islands. Private services also operate between Tarawa and Kiritimati. Shipping services to outer islands are infrequent and do not meet requirements.

KSSL is operating at a loss<sup>92</sup> and vessel repairs and maintenance have not kept pace with degradation. No explicit subsidy is provided to the company, although rates and charges do not cover operating costs.

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<sup>90</sup> Sources: Castalia Interview with Betio Port Master, September 2004

<sup>91</sup> Pacific Regional Transport Study, Volume 2 Country Action Plan: Kiribati” June 2004, from Pacific Islands Forum Secretariat website

<sup>92</sup> Ibid

## *Marshall Islands*<sup>93</sup>

### *Ports*

The Marshall Islands Ports Authority (MIPA) is a statutory body established in 1996. It is responsible for managing the two international ports Majuro and Jaluit. Since establishment, MIPA has received operating subsidies from the Government, but maintenance has not been effective, resulting in deteriorating assets and services<sup>94</sup>.

### *Shipping*

In 1999, the Marshall Islands Cabinet approved a new shipping policy that included competitive tender of Field Trip Services (the term used to describe shipping services to outer island communities in the Marshall Islands) following a move to privatize domestic shipping services. This coincided with a reduction of subsidies to general cargo which resulted in increased carrier charges. A private company currently operates domestic passenger services to all major atolls within the Marshall Islands. The Government is continuing to privatize shipping services, but is reviewing the level of subsidy and freight costs to the end user.

#### **A.4.6 Summary of Analysis**

In summary we observe that:

##### *In Ports:*

- Some ports in the Pacific operate on the traditional ‘Public Service Port Model’ as a government department or as a corporatized port authority<sup>95</sup>. The wharves on outer islands are owned and operated by provincial or local governments
- In the Caribbean, many ports have moved from the Public Service to the Landlord Port Model. Under this model: the Port Authority acts as a landlord and regulates the port operations which are carried out by private operators, infrastructure is leased to private operators who provide and maintain their own superstructure
- In the Pacific the Ports of Suva, Apia, Nuku-alofa and Pohnpei have adopted the landlord model. The Samoa Port Authority is a good example of where this is working successfully
- The landlord model has been less successful in Fiji where services have been contracted out to Government monopolies
- In Samoa and Papua New Guinea there is, competition between private operators appear to have contributed to competitive costs

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<sup>93</sup> Sources: “Marshall Islands Meto 2000 Economic report and Statement of Development Strategies” ADB 2001 and “Technical Assistance to the Republic of the Marshall Islands for Preparing the Outer Island Transport Infrastructure Project” ADB, Sept 2000

<sup>94</sup> The ADB Technical Assistance report (Sept, 200) notes that “Despite the Government’s efforts to maintain ports and airports within the country, the general obsolescence of existing facilities and equipment, coupled with the large distances involved has severely compromised the safety of sea and air transport”

<sup>95</sup> Pacific Regional Transport Study, AusAid, 2004

*In Shipping:*

- Services are considered adequate on international and inter-island routes, which are served by public and private operators. Most routes are open to competition
- Shipping services to outer islands have been subsidized by governments as they are not economic to provide. Some countries, such as Fiji and Marshall Islands have introduced private sector involvement to the provision of these services. In Fiji, a franchise scheme was originally implemented. This model has been revised and a new model in which private operators supply services to a Government Shipping Corporation is being implemented.

## **A.7 Airports and Aviation Sector Analysis**

Most Pacific countries are dispersed across several islands, and served by several airports<sup>96</sup>. Air services have an importance to Pacific countries that is beyond their normal value, due to the countries' isolation and the lack of real surface transport alternatives in many cases. Air transport also enables tourism which varies in importance between countries, but has been identified as an area with substantial development potential. This section reviews the current performance and existing institutional arrangements for airports and air services in Pacific and comparator countries.

### **A.1.7 Benchmarking**

This section benchmarks the performance of Pacific Island and comparator countries airports and air services using a standard set of indicators.

#### ***Airport Capacity***

Table A7 provides a comparison of various capacity indicators for selected Pacific and comparator country airports. Comparator countries are highlighted.

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<sup>96</sup> The Pacific Regional Study (AusAid, 2004) notes that the Pacific Islands Forum Secretariat Countries (including PNG, Cook Islands, Niue and Tuvalu, and excluding Timor-Leste) have a total of 74 civilian airports between them.

**Table A.7 : Airport Capacity Indicators**

Airport	Country	Number of Check in Desks	Number of Baggage Claim Devices	Number of Aircraft Stands	Annual Terminal Capacity (Passenger throughput)	Total Passenger Throughput	Total Aircraft Movements	Total Terminal Area (m2)	Number of Airlines Serving
Grantley Adams	Barbados	65	4	17	2,000,000	2,130,333	43,738	18,580	22
Suva Nausori International Airport	Fiji	6	1						4
Nadi Airport	Fiji	36	3			1,130,763	55,505		> 6
Pohnpei	FSM	6	1	2					3
Point Salines	Grenada	11		7	1,200,000	393,851	10,347	7,430	11
Kingston Manley	Jamaica			20		1,438,791	23,597	20,000	10
Bonriki International	Kiribati	1	0	2					4
Marshall Islands International	Marshall Islands	2	0	2		26719	407		6
Sir Seewoosagur Ramgoolam	Mauritius	20		12	1,500,000	1,914,245	18,907		13
Christchurch	New Zealand			25	5,000,000	4,773,157	156,880		9
Koror	Palau	8	1	2		78608	984	3672	6
Jacksons International	PNG			1					2
Faleolo International	Samoa	6	1	3					4
Henderson	Solomon Islands	3		5		58,388	35,000		2
Robert Bradshaw	St Kitts	24	2						
Hewanorra	St Lucia	35	2	5	440,000	366,229	9,506	7,430	12
Presidente Nicolau Lobato International	Timor-Leste	2	0						
Fua'amotu International	Tonga	9	1	3		130,000	1,141	3,322	4
Port Vila	Vanuatu	8	1	3		1,600	124,601		4

Sources: Various, A-Z World Airports Online ([www.a-zworldairports.com](http://www.a-zworldairports.com)) and Castalia Questionnaires

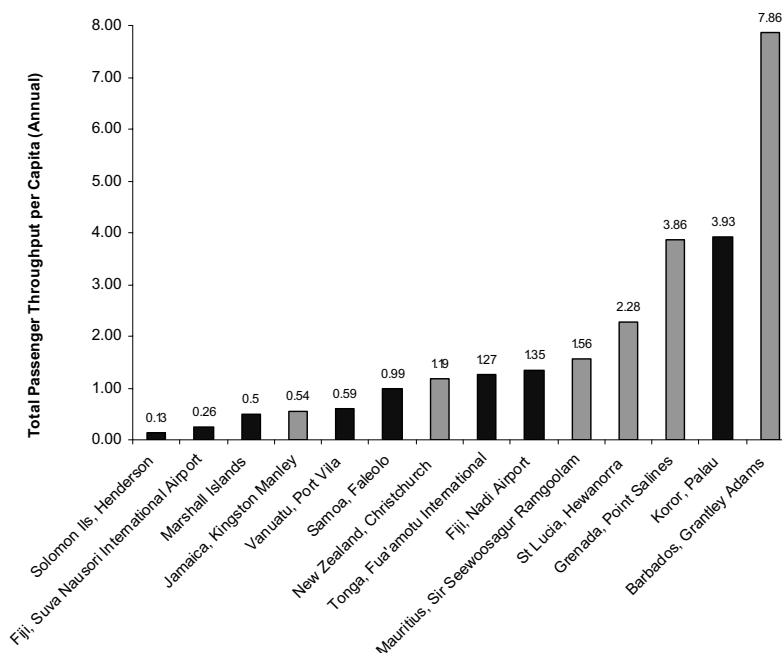
The larger Pacific airports such as Nadi (Fiji), Faleolo International (Samoa) and Port Jackson (PNG) can accommodate a long haul flight on a Boeing 747 aircraft. Fua'amotu International (Tonga) and Port Vila (Vanuatu) can manage B767 aircraft, while Presidente Nicolau Lobato International (Timor-Leste), Bonriki International (Kiribati) and Henderson International (Solomon Islands) can take B737 aircraft.

Technological improvements have had a big impact on air traffic to the Pacific. Thirty years ago a B747 needed to stop at various island nations in order to uplift maximum payload out of Auckland, Los Angeles and Sydney. Now, the B747's range has increased and these aircraft can overfly all Pacific countries. With an increased proportion of traffic terminating in Pacific countries, more B737s are being used on Pacific Island routes.

On average, the Pacific airports have fewer check-in desks (with the exception of Nadi International) and aircraft stands than the comparator airports. They are also served by fewer airlines.

Figure A 36 compares the total passenger throughput per capita on an annual basis at selected Pacific and comparator airports. The Pacific airports in this graph demonstrate a lower overall air transport intensity when compared with the comparator countries. This does not indicate that air travel is less important to Pacific countries than it is to the Caribbean comparators. Air travel is extremely important to Pacific countries as alternative forms of travel are almost non-existent. Rather it reflects smaller tourism sectors in most countries (with the exception of Palau). Isolation, the distance between these destinations and major tourist markets and small population bases contribute to this.

**Figure A.36: Total Passenger Throughput per capita**



Source: A-Z World Airports Online ([www.a-zworldairports.com](http://www.a-zworldairports.com)) and Castalia Questionnaires

### *Airport Quality*

Airport quality is traditionally determined on the basis of customer satisfaction surveys which address several key areas of service quality. However, these are unavailable for most airports in this study.

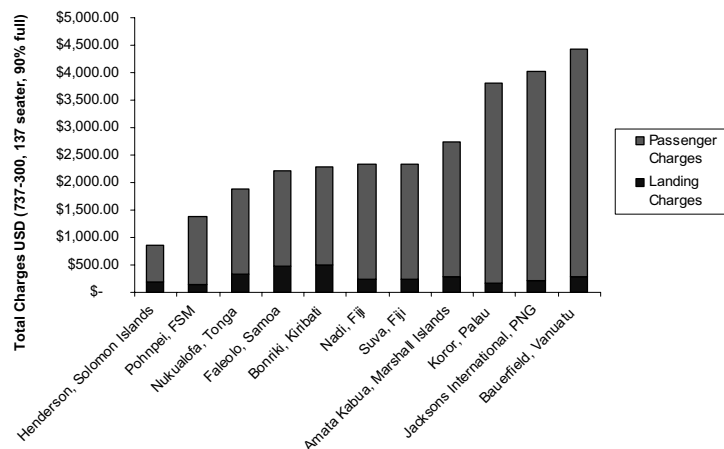
Due to the low level of traffic through many Pacific airports, passengers have little time to wait between arriving and collecting bags, customs and immigration processing and checking in. The average waiting time between arrival and baggage delivery was between five and ten minutes for all airports reviewed. This is quicker than in Caribbean comparator countries (which average between 15 and 20 minutes for baggage to arrive).

Some of the smaller airports, like Bonriki in Kiribati or Presidente Nicolau Lobato International in Timor-Leste, lack normal facilities such as retail outlets, taxi services (although car rental services are available) and air-conditioning or fans in arrival or waiting halls. There are a number of projects planned to upgrade Bonriki International airport. A design has been completed for reconstruction of the runway and taxiway and a tender is being planned for a complete terminal makeover, including x-ray screening for baggage.

### *Airport Charges*

Airport charges are a good way for airports to cover operating and capital costs. They are composed of landing charges, parking charges, passenger charges and other surcharges. Figure A37 compares the standard airport charges at Pacific airports for a representative aircraft the 737-300 with 137 seats, 90% full.

**Figure A.37: Airport Charges**



*Source: Air New Zealand Flight Operations – Landing and Passenger Charges, August 2004*

Total charges include landing and passenger charges for each destination. Parking, lighting, boarding bridge and garbage incineration charges (applied at some airports) are not included in this calculation. The graph shows a breakdown of the total cost of taking off and landing at each of these airports and indicates charges directly to the airline (landing charges) and charges to the passenger.

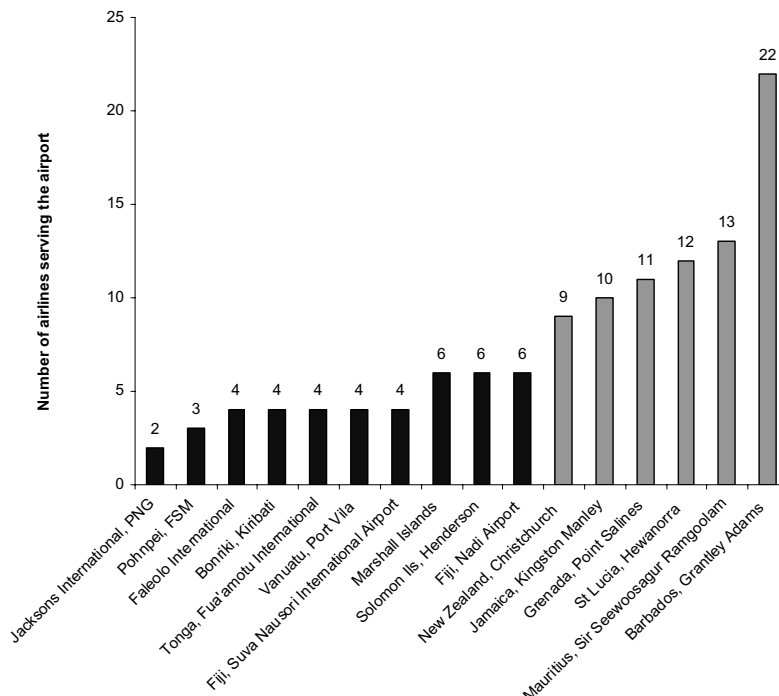
The Solomon Islands has the lowest overall airport charges. Federated States of Micronesia also has relatively low landing and passenger charges. Palau, Papua New Guinea and Vanuatu have significantly higher passenger charges than other Pacific countries. In all countries, passenger charges are significantly higher than landing charges.

Charges collected may not be the same as revenue received by the airport. In some countries passenger charges or taxes are passed on directly to governments. In other cases these charges go to the operator. In addition, many Pacific airports only charge international passengers; domestic passenger charges are kept to a minimum. This is problematic for airports like Suva or Bonriki in Kiribati, where domestic traffic makes up a significant proportion of passenger throughput. Passengers use the facilities, but airports do not have the opportunity to recover these costs.

### Airline Services

Figure A.38 illustrates the number of commercial airlines that serve selected Pacific airports.

**Figure A.38: Total Number of Airlines Serving Airports**



Source: A-Z World Airports Online ([www.azworldairports.com](http://www.azworldairports.com)) and Castalia Questionnaires

Excluding Australian and New Zealand airlines, and including the French sphere of influence, there are 21 airlines based in the region<sup>97</sup>. Continental Micronesia, Air Pacific, Polynesian Airlines and Air Niugini are among the biggest airlines operating in the countries reviewed for this study. Qantas and Air New Zealand operate direct routes to selected destinations in the region. Qantas has a 46% shareholding in Fiji's Air Pacific. Pacific Blue (a low cost entrant associated with Virgin Blue in Australia) is already flying selected routes. It is expected that Freedom Air (a low cost airline owned by Air New Zealand) will follow with similar offerings within the year.

All Pacific destinations are served by fewer airlines than the comparator countries. This is partly due to the remoteness of the region. Neither the Caribbean nor the Pacific have open skies arrangements, but the Caribbean has a more concentrated geography and this, together with its proximity to large markets such as the USA contributes to more tourists and more outbound domestic travel than occurs in the Pacific. Anecdotal evidence suggests that while services to countries such as Fiji are adequate, service to destinations like Solomon Islands, Vanuatu and Kiribati are not<sup>98</sup>.

<sup>97</sup> "Pacific Regional Transport Study" (AusAid, 2004)

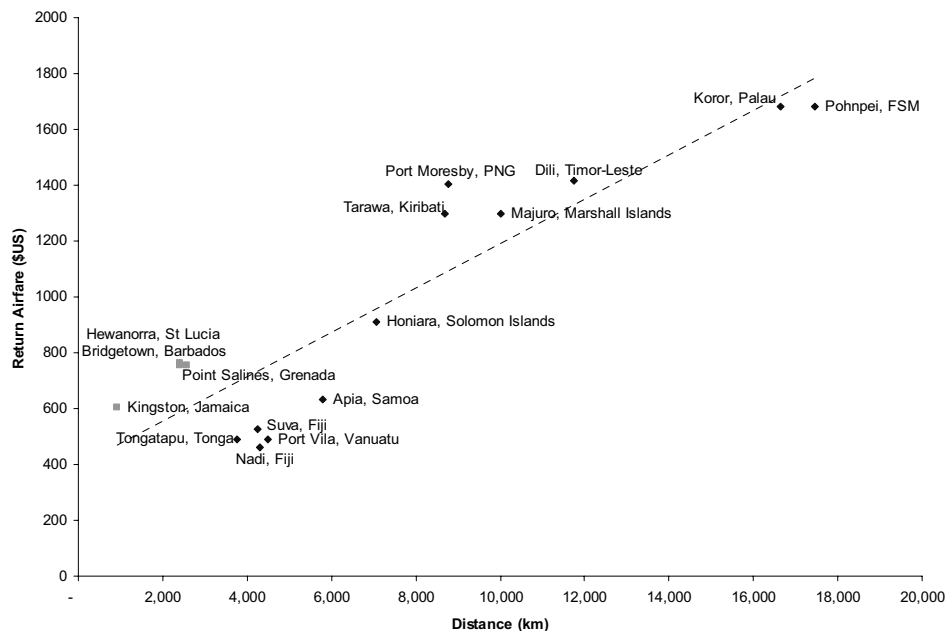
<sup>98</sup> "Pacific Regional Transport Study" (AusAid, 2004)



## Airfares

Figure A.39 compares the cost of a return airfare<sup>99</sup> from Auckland to selected Pacific destinations and from Miami to selected Caribbean destinations, and the distance (km). The flights between Jamaica and Miami and between Barbados and Miami are direct routes.

**Figure A.39: Airfare Cost (US\$) vs. Distance (km)**



Source: Airfares quoted by the Terrace Travel. Pacific airfares for October 2004, Caribbean airfares for May 2004  
 Note: PNG: Papua New Guinea, FSM: Federates States of Micronesia. 1 NZD = 0.6621 USD

This shows that given the distance involved, a return flight to Fiji, Tonga, Samoa and Vanuatu from Auckland is cheaper than return flights from Miami to the Caribbean comparator countries shown here. Return flights from Auckland to Kiribati, Papua New Guinea, Timor-Leste and the Marshall Islands are more expensive relative to distance.

## Safety and Security

International airport and air service security is coordinated by the International Civil Aviation Organization (ICAO).

To overcome human resources constraints, Pacific leaders have been exploring the concept of a regional regulatory office for safety, the Pacific Aviation Safety Office (PASO). PASO would be responsible for regulation, oversight and personnel licensing for flight operations, airworthiness, airports and security. The organization will offer ‘user pays’ services (such as inspection services) at a favorable rate for member countries. Member countries will not be obliged to use PASO services, but they will be required to meet PASO standards. It is envisaged that this organization will require external funding assistance over the initial

<sup>99</sup> Fares vary by route, carrier and class. To provide a consistent standard, this graph compares mid-range economy return airfares to give a realistic indication of what the average traveller could expect to pay on these routes.

establishment period. For the office to be effective all member states have to adopt standard rules based on New Zealand legislation. Intended member states are Tonga, Samoa, Vanuatu, Kiribati, Solomon Islands, Fiji and Papua New Guinea. Only Kiribati, Samoa, Tonga and Vanuatu are currently signatories. BoxA.11 contains a description of regional air regulation in the Eastern Caribbean States.

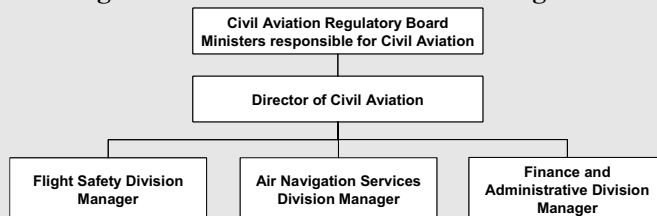
**BoxA.11 : Regional Air Regulation in the Organization of Eastern Caribbean States**

**The Directorate of Civil Aviation (the Directorate) is based in St Johns Antigua. It was established in 1957 to facilitate a collective and uniform approach to Civil Aviation matters affecting the then Windward and Leeward Islands, now known as the Organization of Eastern Caribbean States (OECS). The West Indies Associate States (WIAS) Council of Ministers is responsible for the administration of the organization.**

**The Directorate’s objectives are to:**

- **Develop and maintain a safe Civil Aviation environment for OECS Governments, air carriers, operating flight crew and traveling public**
- **Develop a safe, efficient and modernized Civil Aviation infrastructure in the OECS**
- **Assist in the development of tourism in the OECS by providing sound technical advice to the Air Transport Licensing Boards of all the participating governments in the advancement of air transport in their respective territories**
- **Maintain a high quality of telecommunications and air navigation facilities at OECS airports**
- **Provide safety oversight through a system of inspecting, investigating, maintaining, monitoring, coordinating, licensing and regulating all Civil Aviation activities in the OECS in accordance with the applicable ICAO annexes and Civil Aviation Legislation.**

**The diagram below shows the Directorate’s organizational structure:**



**The Directorate operates under the directive of the OECS Civil Aviation regulatory Board, comprised of OECS Ministers responsible for Civil Aviation. This body sets aviation policy and reviews Aviation laws and regulations within the OECS.**

**The Director of Civil Aviation is a Chief Executive Officer who reports to the Aviation Board. He is responsible for the day to day operations of the Directorate and advises the Board on Air Fares, rates, Air Services Agreements, Air Transport and Environmental Protection. He is assisted by the Managers of the Flight Safety, Air Navigation Services and Finance and Administrative Division Managers. These divisions are each staffed by officers and Technical Specialists.**

**Source: *www.oecs.org***

### A.2.7 Institutional Analysis for Airports

Most of the Pacific airports in this review are administered by government departments or statutory corporations. Non core services such as retail, ground handling or car rental are often provided by private operators. Table A.8 provides an overview of the institutional arrangements selected airports in the Pacific.

#### *Fiji<sup>100</sup>*

In 1999 the Civil Aviation Authority of Fiji was reorganized into the operational functions of Airports Fiji Limited (AFL) and the Civil Aviation Authority of Fiji Islands (CAAFI). The Ministry of Transport and Civil Aviation (MOTCA) is responsible for the sector's legal framework.

AFL is a state-owned entity. It is licensed by the Government to manage air traffic services in the Fiji Islands region, operate, maintain and manage the 16 public airports including the 2 international airports at Suva and Nadi and control all associated revenue generating activities. AFL operates Suva and Nadi airports on a commercial basis. Revenue from Nadi (which runs at a profit) is used to cross-subsidize the Suva operations which are running at a loss of around 2 million Fijian Dollars a year. AFL receives a grant from the fiscal budget to manage the domestic airports as a supplement to airport revenues. These funds have been insufficient to support airport operations and maintenance costs.

CAAFI is responsible for sector regulation and owns 51% of Airport Terminal Services, which provides ground handling services at Nadi airport. It is also responsible for personnel, operator certification, licensing, aircraft worthiness certification and meeting the Fiji Islands obligations under the international aviation convention. The Government instructed CAAFI to reemploy approximately 300 staff members who had been made redundant when the Authority was incorporated. This imposes a significant additional expenditure burden on the organization and raises a question about its efficiency.

AFL has managed to reduce its total workforce from 562 to 450 people. The government will not support any attempts to terminate staff or make people redundant even for poor performance. The airport management recognizes this as a 'social obligation cost' and recognizes that productivity levels could be increased by outsourcing activities to the private sector. Terminal cleaning was recently outsourced to a private operator because of the extremely poor performance of existing cleaning staff. The cleaning staff could not be made redundant so they have been re-deployed to perform other activities such as porter services, serenading parties for arriving visitors and kerbside management within the car park.

AFL acknowledges that some of the key issues in the past have been a lack of revenue growth, poor profitability, rising costs, poorly maintained assets, overstaffing, lack of strategic business direction and challenging industrial relations. The company is trying to develop additional revenue streams in an effort to cover operating and maintenance costs. One initiative currently under review is to develop the land around the airport.

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<sup>100</sup> Sources: Castalia interview with the CEO of Airports Fiji Limited, September 2004; "Technical Assistance to the Republic of the Fiji Islands for Preparing the Civil Aviation and Airports Improvement Project", ADB 2003 and Republic of the Fiji Islands 1999 Economic Report, ADB Pacific Studies Series, 1999

### *Vanuatu*<sup>101</sup>

Airports Vanuatu Limited (AVL) is a government owned corporation responsible for operating the three largest airports. The remaining airports and airstrips are operated by the Department of Civil Aviation (DCA). The DCA is also responsible for regulating all airports in Vanuatu according to the New Zealand Civil Aviation regulations, adopted in November 1999. DCA's regulatory oversight includes the international airports operated by AVL. The Vanuatu Infrastructure Master plan notes that establishing AVL and separating its functions from the DCA has resulted in improved data collection, consultation, revenue collection and airport operation and maintenance.

Maintenance work on international and domestic airstrips has been inadequate. In addition, the main international airports are restricted to the operation of 737s and smaller aircraft. Runway length and obstacle constraints make runway extension questionable. This has been noted as a key constraint to the development of Vanuatu's tourism sector. The remoteness of many of the domestic airstrips increases the maintenance cost substantially.

### *Marshall Islands*<sup>102</sup>

The Marshall Islands Airport Authority (MIAA) is a statutory corporation responsible for the management of Amata Kabua International Airport in Majuro, taking over from the Directorate of Civil Aviation, the civil aviation regulatory body. Since establishment, there have been improvements in management, operation and maintenance of this airport.

### *Timor-Leste*<sup>103</sup>

The Directorate of Civil Aviation (DCA) in the Ministry of Transport, Communications and Public Works (MTCPW) is responsible for all policy, regulation, enforcement, infrastructure planning, management and operation in the aviation sector. Works and maintenance are delivered by DCA staff and private sector contractors. The Basic Law for Civil Aviation provides the basis for sector regulation. The decision to keep regulation and air traffic services under the same body was a pragmatic one, based on the small size of the aviation sector. Although it is designed to be self funding, limited air traffic means that airport fees are inadequate to fund maintenance and capital works at the airports.

Presidente Nicolau Lobato International airport near Dili (formerly Comoro airport) handles all international traffic. There is no domestic airline or domestic scheduled traffic in Timor-Leste due to low demand and short internal distances.

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<sup>101</sup> Sources: "Vanuatu Infrastructure Masterplan" Republic of Vanuatu, 2002, "Vanuatu: Economic Performance and Challenges Ahead" ADB Pacific Studies Series, 2002

<sup>102</sup> Sources: "Marshall Islands Meto 2000 Economic report and Statement of Development Strategies" ADB 2001

<sup>103</sup> Sources: "Timor-Leste Transport sector Investment Plan" World Bank, 2004

**Table A.8: Institutional Indicators for Pacific Airports**

	Nadi Airport, Fiji	Faleolo International, Samoa	Bonriki International, Kiribati	Dili, Timor- Leste	Bauerfield, Port Vila, Vanuatu	Koror, Palau	Fua'amotu International, Tonga	Pohnpei, Federated States of Micronesia	Amata Kabua, Marshall Islands
Airports and aviation sector legislation?	Y	Y	Y	Y	Y		Y	Y	Y
Independent Regulator?	Y	Y	N	N	Y	N	N	N	N
Administration Corporatized?	Y	Y	N	N	N	N	N	Y	Y
Autonomous Board independent from Executive Power?	Y	Y	N	N	N	N	N	Y	Y
Private Ownership of:									
- Airport Infrastructure	N	N	N		N	N	N	N	N
- Terminal Facilities	N	N	N		N	N	N	N	N
Private Sector Participation in:									
- Airport Infrastructure	N	N	N		N	N	N	N	N
- Terminal Facilities	N	N	N		N	N	N	N	N
- Ground Handling	N	Y	N		Y	Y	Y	Y	N
- Fuelling	N	N	N		Y	Y	Y	Y	Y
- Shopping	Y	Y	N		Y	Y	Y	Y	Y
- Catering	N	N	N		Y	N	Y	N	Y
- Car Rentals	Y	N	N		Y	Y	Y	Y	Y
Competition in:									
- Airport services at the airport?	N	N	N		Y	Y	Y	N	N
- Among airports in the country?	N	N	N		N	N	N	N	N
Does the airport have ICAO certification?	Y	Y					N	N	Y

## Samoa<sup>104</sup>

The Samoa Airport Authority (SAA) is a government owned statutory authority responsible for four airports. Corporatization has enabled the airport authority to establish a sound commercial operating basis. It has not resulted in the same shift in profitability that the Samoa Port Authority experienced. SAA recorded an overall low at the end of 2002 when the effect of depreciation and interest on airport capital works was accounted for, despite small profit recordings in 2000 and 2001. It has managed to move away from a heavy dependence on aid funded staff and now manages its most operations with domestic personnel, but revenue generated is not sufficient to recover full operating and maintenance costs.

Faleolo airport is constrained by its distance from Apia (35km). This has resulted in relatively lower levels of traffic and a situation in which domestic and regional passengers (mostly from American Samoa) traveling through Fagali'i airport cross-subsidize the international traffic. Functions are also duplicated between Fagali'i and Faleolo. A recent study of the airports concluded the Fagali'i should be closed in a three stage process.

### Summary of Analysis

We are able to comment on some airports, based on past studies, interviews and information gathered from questionnaires. We have observed that in the airports sector:

- The number of airports in the Pacific region is adequate, but maintenance is poor. Airport utilization levels and the capacity of the airport terminal infrastructure are low when judged against the comparator countries. One reason commonly given for this is that low levels of traffic, do not demand a greater number facilities (e.g. terminal capacity, check in desks or baggage claim belts) and constrain the amount of funding available for such expansion
- Most airports in the region are government owned and operated in the form of statutory corporations or Civil Aviation bureaucracies. The formation of statutory corporations has had mixed results. One reason for this has been a lack of clarity on the role and responsibilities of the government and the corporation, and of transparency in management structures<sup>105</sup>. Where statutory corporations have resulted in commercial entities, independent of government funding, this has been successful
- Private sector ownership and operation of airports is extremely limited in the Pacific. Introducing private operation of the whole airport in the form of a long term concession is one option which might help to improve the quality of services at a reasonable cost to the authority. This model has been successfully employed in Jamaica (Sangster) and throughout the Dominican Republic. This model would be suitable for larger airports such as the main international airports in Fiji, Vanuatu or Samoa. Whether it was suitable for very small airports, like those in the Marshall Islands, Kiribati or Palau would depend on the degree of interest from qualified private firms

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<sup>104</sup> Sources: Castalia Interviews, Samoa Transport Sector Review: Draft Final Report May 2003, World Bank, Samoa Action Plan "Pacific Regional Transport Study" June 2004 (AusAid) on [www.forumsec.org.fj](http://www.forumsec.org.fj)

<sup>105</sup> "Pacific Regional Transport Study" AusAid, 2004

- An alternative reform model is for the Government to operate on a 'Landlord' basis, with selected services contracted out to private operators. In smaller airports, contracts could be awarded for all terminal services instead of on a service by service basis
- Existing traffic to and from the Pacific does not appear to justify significant airport expansion. However, expansion would contribute to, and be necessary for, an expanded tourist industry within the region. The experience in Punta Cana in the Dominican Republic suggests that if governments are prepared to support private investment in an entire tourist package, the country may benefit from increased tourism while limiting government investment and risk.

### A.3.7 Institutional Analysis for Air Services

Many Pacific countries' air services are governed by bilateral air services agreements which provide a framework within which airlines of one country are allowed to fly into and beyond the other country. The frequency, capacity and other operational issues are normally covered by Memoranda of Understanding (MOUs) accompanying the agreements. The agreements cover the rights of carriers to carry passengers originating and terminating in foreign territories.

For many years, these agreements have limited the airlines allowed to fly between various countries to their national carriers, and restricted capacities on routes. Unusually, Samoa has an open skies agreement with the United States including beyond rights. Now, Pacific Countries are considering liberalization, as outlined in Box A.12.

Box A.12 : Open Skies in the Pacific: Pacific Islands Air Services Agreement (PIASA)

The Pacific Islands Air Services Agreement (PIASA) is a Pacific Islands Forum Secretariat initiative aimed at preparing Pacific Island countries for gradual adoption of a region-wide 'open skies' regime. In May 1998, the Pacific Islands aviation ministers agreed in principle to move towards the liberalization of regional air services agreements and at a subsequent meeting in 1999, they agreed to the concept of a single Pacific Islands aviation market with the drafting of a multi-lateral agreement, which the Pacific Islands Forum Secretariat would organize. The impetus for these agreements was the recognition that existing bilateral agreements restricted market access within the region and limited the growth and development of air transport.

PIASA is due to be implemented in three phases over a period of five years. The first phase involves granting Fifth Freedom rights to new Pacific Islands Forum Secretariat countries that do not currently have international services. Phase two involves extending Fifth Freedom rights to all countries to operate within the region, and in the third phase Fifth Freedom rights will be extended to all Pacific Islands Forum Secretariat countries outside the region.

Current signatories to PIASA are the Cook Islands, Nauru, Samoa, Tonga and Vanuatu. Protecting national carriers is one of the key reasons more countries have not yet signed up to this agreement. The Association of the South Pacific Airlines (ASPA) has noted that "the national carriers of the region warrant relative protection from "unnecessary" competition on some profitable routes which have been developed by and invested in by Pacific island carriers". The argument is that the national carriers in the region are operating in a relatively high-cost environment and would not be able to cope with competition on most routes. It is feared that this would result in the collapse of some of the smaller national carriers in a similar manner to the Ansett collapse. This position is supported by Fiji.

In fact, neither the Ansett collapse nor the financial difficulties of Air New Zealand, have resulted in fewer (or no) air services to New Zealand. On the contrary, several new carriers have started flying to the country on main routes, such as United Arab Emirates and Pacific Blue.

*Source: "Fiji's position on multilateral air service agreements" Worldwide Air Transport Conference. Challenges and Opportunities of Liberalization, 2003; Pacific Islands Forum Secretariat and Castalia Research*

## *Institutional Arrangements in Aviation Services*

### ***Fiji***<sup>106</sup>

Airlines play an important role in facilitating tourism. Fiji is served by four international carriers. This is low compared to Caribbean destinations – by way of comparison. Barbados is served by over 20 airlines.

Within Fiji air services are provided by Air Pacific and Air Fiji. The Government has a majority shareholding (51%) in Air Pacific (the national flag carrier) and a minority shareholding in Air Fiji. These airlines do not receive subsidies from the Government and operate on a commercial basis. There are regular links between some of the bigger domestic airports, while smaller outer islands are served infrequently. Due to the small market for domestic air services, opportunities for competition are restricted to main routes.

### ***Vanuatu***<sup>107</sup>

International air services are provided by Air Vanuatu, a Government owned operation. The airline has a history of incurring large losses, although the airline recorded an operating profit in five of the past 10 years. The airline is now profitable and operates three aircraft<sup>108</sup>. Limited competition has enabled Air Vanuatu to remain viable, but this has also resulted in high air transport costs and limited tourists. Due to risk aversion, it did not expand despite growing demand. The resulting high fares and relatively infrequent service has constrained the growth of the tourist industry. In response to this, the Government declared open-skies. Pacific Blue announced its intention to begin serving Vanuatu from Australia in 2004. Anecdotal information suggests that this resulted in a significant boost to confidence and waterfront land prices in Port Vila. Air Vanuatu invested in a regional aircraft which has yet to perform regional services due to technical difficulties. There have been some attempts to get Vanair to take on this aircraft in order to reduce the costs to Air Vanuatu.

Vanair is also Government owned provided domestic transport independently until 2001, when it merged with Air Vanuatu. After the merger, airfares were increased to improve the profitability of the domestic air transport market.

### ***Samoa***<sup>109</sup>

Polynesian Airlines is the Samoan national carrier. It is 100% government owned. The airline has been operating at a loss for a number of years and is a significant burden on the government budget. The Government has invested a total of \$WST 146.5 million into the airline since 2003. The Government budget shows another \$WST 9 million in support to the airline for 2004. These losses appear unsustainable and with the introduction of new low cost carrier services such as Air New Zealand's Pacific Express and with other similar carriers competing for traffic in the region, this situation could become even more untenable.

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<sup>106</sup> Sources: Castalia interview with the CEO of Airports Fiji Limited, September 2004; "Technical Assistance to the Republic of the Fiji Islands for Preparing the Civil Aviation and Airports Improvement Project", ADB 2003 and Republic of the Fiji Islands 1999 Economic Report, ADB Pacific Studies Series, 1999

<sup>107</sup> Sources: "Vanuatu Infrastructure Masterplan" Republic of Vanuatu, 2002, "Vanuatu: Economic Performance and Challenges Ahead" ADB Pacific Studies Series, 2002

<sup>108</sup> It operates a B737, an ATR 42 and Bandeirante aircraft "Pacific Regional Transport Study" AusAid, 2004

<sup>109</sup> Sources: Castalia Interviews, Samoa Transport Sector Review: Draft Final Report May 2003, World Bank, Samoa Action Plan "Pacific Regional Transport Study" June 2004 (AusAid) on [www.forumsec.org.fj](http://www.forumsec.org.fj)



Box A. Box A13 : Troubled Times for Tongan Airlines

Royal Tongan Airlines (RTA), formerly Friendly Island Airways, was the national carrier of the Kingdom of Tonga until 2004. Owned by the Tongan government, it operated both national and international services. The airline's international routes linked Tongatapu with Sydney, Auckland, Nadi, Apia, Honolulu and Niue, and included code-shared flights with Air Pacific and Air New Zealand. Inter-island air services linking Tongatapu with 'Eua, and the Ha'apai and Vava'u island groups ran daily except for Sundays, a strongly enforced day of rest and religious observation in the island nation. Service to the outer-island Niua group was infrequent, due to the small population and lack of demand, with flights leaving only around once per month.

The airline acquired its first aircraft, two Twin Otters, in 1989. After this, services were increased through leasing aircraft. This included a 737-300 aircraft from Air Pacific, to maintain international services to New Zealand, Samoa and Fiji, an HS 748 aircraft from Mt Cook Airlines, to fly on the route via Vava'u to Nadi in Fiji, and a Hawker Sidley S748 Twin Otter for twice weekly service to Niue. A Royal Brunei Airlines Boeing 757 was chartered in November 2003, and used for the "Tongan Sea Eagle" route to Hawai'i, inaugurated in January 2004. This service was stopped suddenly in April 2004 when the aircraft was returned to its owner.

The repossession signaled the beginning of the end for RTA, which had been in financial difficulty for some time and was chiefly reliant on significant governmental support from public funds to remain aloft. Such support had allowed the airline, in spite of critical financial shortfalls, to extend its services in November 2003. Fuel suppliers, other airlines and travel agents, in recognition of the airline's poor credit status, had begun insisting on cash payments in the months prior to the Royal Brunei aircraft's repossession, but significant amounts were still owed - a debt unable to be met by the Tongan government, which had recently suffered another financial disaster when the king loaned US\$42.7 million to his court jester, who lost it on ill-chosen investments.

In May 2004, domestic operations of RTA were also brought to a halt, and the government appointed a liquidator to close down the airline's operations, acknowledging its severe financial problems. Severance arrangements for hundreds of Royal Tongan employees were negotiated, and compensation paid to international passengers stranded by the airline's sudden demise. The government began exploring the possibility of private sector participation to ensure Tonga retained dedicated, locally-based airline links with the outside world, in line with the economic reform program launched in 2002 emphasizing the development of the private sector and the creation of a level field for entrepreneurial competition. However, negotiations in this area appear to have failed and the nation is now reliant on international services from outside operators.

Domestic services were restored in June 2004 when Peau 'o Vava'u, run by New Zealand company Pion Air operating in affiliation with a local counterpart, was granted a license to operate daily flights in its two 70-year-old DC3s from Tongatapu to Vava'u and Ha'apai. The busy routes attracted a number of contenders to operate the service, including local company FlyNiu Airlines, owned and operated by former staff of RTA. FlyNiu was also granted a license to operate on the Vava'u and Ha'apai routes in a Dash 8 leased from Air National of New Zealand, but in a controversial decision six weeks later the Ministry of Civil Aviation announced that only one airline would be allowed to operate domestically, and both airlines would have to reapply for this license. Several members of Tonga's Royal Cabinet were forced to resign after opposing the idea of the monopoly airline, but little surprise was expressed when the Prime Minister awarded the sole license to Peau 'o Vava'u, an airline in which his brother, the Crown Prince, has a half-share. The controversy has illustrated that, despite plans for reform, the aviation industry in Tonga is still very much under governmental control.

*Source: Matangi Tonga (www.matangitonga.to)*

### ***Summary of Aviation Analysis***

The Pacific Island Countries Trade Agreement (PICTA) includes a commitment to phased liberalization of services, possibly including multilateral agreements along the lines of the PIASA agreement. Competition for air services in the region is limited. Open skies, or multilateral air services agreements will encourage competition, providing more choice and lower fares for passengers. This is likely to benefit the tourist trade in Pacific countries despite challenges of isolation and small scale.

Many of the Pacific carriers either operate at a loss or are only marginally economic. Introduction of low cost competition could further reduce their sustainability. Most countries retain their flag carriers as a means to ensure continuity of air service, but this is not always a financially sustainable solution. Governments should consider privatizing or shutting down national airlines, and (where necessary) using competitively bid air services contracts to ensure continuity of service. Under such contracts, airlines would agree to service specified routes at specified frequencies, in return for an agreed subsidy. The cost of the subsidy could be lower than the cost of maintaining and operating a loss-making flag carrier.

## Appendix B: Key Infrastructure Indicators

### Source Key:

CIA	CIA World Factbook
HDR	Human Development Report
IMF	International Monetary Fund
ITU	International Telecommunication Union
WDI	World Development Indicators

1	Special Evaluation Study on Asian Development Bank Capacity Building Assistance for Managing Water Supply and Sanitation to the Republic of Fiji Islands, Kiribati, Papua New Guinea and the Republic of the Marshall Islands, ADB 2003
2	Pacific Regional Transport Study
3	Regional Engagement Framework FY2006 – 2008 for Pacific Islands, World Bank
4	Castalia Research
5	Castalia Research
6	Regulatory Framework and Transition Models for Private Participation in Infrastructure in Pacific Island Countries, Meritec, 2001

	Fiji			Kiribati			Marshall Islands			Micronesia			Palau			Papua New Guinea		
	Data	Year	Source	Data	Year	Source	Data	Year	Source	Data	Year	Source	Data	Year	Source	Data	Year	Source
<b>Energy</b>																		
<b>Access</b>																		
Access to Electricity Network (% of population)	60.0	2002	6				100.0	2002	6	43.0	1999	6	60.0	1999	6			
Fuel imports (% of merchandise imports)	12.7	2002	WDI	10.4	2002	WDI	29.7	2002	WDI	14.2	2002	WDI	-			22.1	2002	WDI
<b>Tariffs</b>																		
Average End-User Electricity Price (US ¢/kWh)	25.0	2002	6															
Bill for medium-user household (US\$/month)	29.3	2002	6															
<b>Efficiency</b>																		
System Losses (% total generation)	8.6	1999	6				14.0	1999	6	25.3	1999	6	15.0	1999	6			
Total number of employees per 1000 connections	20.4	1999	6															

	Samoa		Solomon Islands		Timor-Leste		Tonga		Vanuatu	
	Data	Year	Data	Year	Data	Year	Data	Year	Data	Year
<b>Energy</b>										
<b>Access</b>										
Access to Electricity Network (% of population)	60.0	1999	10.0	1999		6	85.0	1999	25.0	1999
Fuel imports (% of merchandise imports)	-		24.7	2002	-		16.3	2002	15.0	2002
<b>Tariffs</b>										
Average End-User Electricity Price (US ¢/kWh)	18.0	1999	16.0	1999		6			27.0	1999
Bill for medium-user household (US\$/month)	68.1	1999	28.5	1999		6			80.9	1999
<b>Efficiency</b>										
System Losses (% total generation)	22.1	1999	14.6	1999		6	17.9	1999	6.7	1999
Total number of employees per 1000 connections	16.9	1999	26.3	1999		6			27.7	1999

	Barbados		Dominica		Grenada		Jamaica		Mauritius		Philippines		St. Kitts and Nevis		St. Lucia											
	Data	Year	Source	Data	Year	Source	Data	Year	Source	Data	Year	Source	Data	Year	Source	Data	Year	Source								
<b>Energy</b>																										
<b>Access</b>																										
Access to Electricity Network (% of population)																										
Fuel imports (% of merchandise imports)	6.3	2002	WDI	96	2002	WDI	99	2002	WDI	17.8	2002	WDI	10.4	2002	WDI	9.2	2002	WDI	91	1999	WDI	9.9	2002	WDI		
<b>Tariffs</b>																										
Average End-User Electricity Price (US ¢/kWh)				27	2002	WDI	22	2002	WDI																	
Bill for medium-user household (US\$/month)				108	2002	WDI	61	2002	WDI																	
<b>Efficiency</b>																										
System Losses (% total generation)				19	2002	WDI	14	1999	WDI																	
Total number of employees per 1000 connections				8	2001		6	2001																		

	Fiji		Kiribati		Marshall Islands		Micronesia, Fed. Sts.		Palau		Papua New Guinea	
	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source
<b>Information and Telecommunications</b>												
<b>Access and use</b>												
Main telephone lines per 100 inhabitants	12	2002 ITU			8	2002 ITU	9	2001 ITU	35.1	2002 3	1.1	2002 ITU
Cellular mobile telephone subscribers per 100 inhabitants	11	2002 ITU	1	2002 ITU	1	2002 ITU	1	2002 ITU			0.3	2002 ITU
Total telephone subscribers per 100 inhabitants	23	2002 ITU	6	2002 ITU	9	2002 ITU	9	2002 ITU			1.4	2002 ITU
Internet users	50000	2002 ITU										
<b>Prices and Affordability</b>												
Cost of Phone Call to US (US\$/3 minutes)	4.0	2002 ITU										
Cost of Local Phone Call (US\$/3 minutes)	0.1	2002 ITU	0.1	2002 ITU							0.1	2002 ITU
Cost of Cellular Local Call (US cents/3 off-peak minutes)	0.3	2002 ITU										
Internet total monthly price (\$ per 20 hours of use)	25.9	2002 ITU	43.5	2002 ITU			15	2002 ITU	12.9	2002 3		
<b>Quality</b>												
Telephone faults (per 100 mainlines)	9.2	2002 ITU					48	2001 ITU				

	Samoa		Solomon Islands		Timor-Leste		Tonga		Vanuatu	
	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source
<b>Information and Telecommunications</b>										
<b>Access and use</b>										
Main telephone lines per 100 inhabitants	6.5	2002 ITU	1.5	2002 ITU	0.26	3	11.3	2002 ITU	3	2002 ITU
Cellular mobile telephone subscribers per 100 inhabitants	1.5	2002 ITU	0.2	2002 ITU			3.4	2002 ITU	2	2002 ITU
Total telephone subscribers per 100 inhabitants	8.0	2002 ITU	1.7	2002 ITU			14.7	2002 ITU	6	2002 ITU
Internet users	4000	2002 ITU	2200	2002 ITU				ITU	7000	2002 ITU
<b>Prices and Affordability</b>										
Cost of Phone Call to US (US\$/3 minutes)	4.1	2002 ITU	10.3	2002 ITU					9.0	2002 ITU
Cost of Local Phone Call (US\$/3 minutes)	0.03	2002 ITU	0.1	2002 ITU			0.1	2002 ITU	0.2	2002 ITU
Cost of Cellular Local Call (US cents/3 off-peak minutes)			0.9	2002 ITU						
Internet total monthly price (\$ per 20 hours of use)	17.1	2002 ITU	43.0	2002 ITU	22.2	3			45.5	2002 ITU
<b>Quality</b>										
Telephone faults (per 100 mainlines)	22.0	2000 ITU	5.0	1999 ITU			761	1996 ITU		



Information and Telecommunications	Barbados		Dominica		Grenada		Jamaica		Mauritius		Philippines		St. Kitts and Nevis		St. Lucia	
	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source
<b>Access and use</b>																
Main telephone lines per 100 inhabitants	49	2002 ITU	30	2002 ITU	32	2002 ITU	17	2002 ITU	27	2002 ITU	4	2002 ITU	50	2002 ITU	32	2002 ITU
Cellular mobile telephone subscribers per 100 inhabitants	36	2002 ITU	12	2002 ITU	7	2002 ITU	53	2002 ITU	29	2002 ITU	19	2002 ITU	11	2002 ITU	9	2002 ITU
Total telephone subscribers per 100 inhabitants	86	2002 ITU	42	2002 ITU	39	2002 ITU	70	2002 ITU	56	2002 ITU	23	2002 ITU	61	2002 ITU	41	2002 ITU
Internet users			12,500	2002 ITU	15,000	2002 ITU			125,000	2002 ITU			10,000	2002 ITU		
<b>Prices and Affordability</b>																
Cost of Phone Call to US (US\$/3 minutes)													1.83	2002 ITU		
Cost of Local Phone Call (US\$/3 minutes)									0.04	2002 ITU			0.09	2002 ITU		
Cost of Cellular Local Call (US cents/3 off peak minutes)									0.1	2002 ITU						
Internet total monthly price (\$ per 20 hours of use)									20.0	2002 ITU	20.0	2002 ITU			91.2	2002 ITU
<b>Quality</b>																
Telephone faults (per 100 mainlines)					9	2002 ITU	39.7	2002 ITU	56.8	2002 ITU						

	Fiji		Kiribati		Marshall Islands		Micronesia		Palau		Papua New Guinea	
	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source
<b>Water</b>												
<b>Access</b>												
Improved sanitation facilities (% of population with access)	43	2000 WDI	48	2000 WDI			59.3	2000 WDI	100	2000 WDI	82	2000 WDI
Improved water source (% of population with access)	47	2000 WDI	48	2000 WDI			94.8	2000 WDI	79	2000 WDI	42	2000 WDI
<b>Quality</b>												
Availability of water supply ( Hours per day)	20	1	1	1	3.5	1					24	1
<b>Tariffs and Costs</b>												
Average Tariff (US\$ per m3)	0.132	1	0.541	1								
Cost Recovery Ratio	45%	1	69%	1	89%	1					110%	1
<b>Efficiency</b>												
Non-Revenue Water (%)	59%	1	50%	1	35%	1					38%	WDI
% Metered Connections	100%	1	1%	1	98%	1					100%	WDI
Staff per 1000 connections	9	1	10.6	1	18	1					55	WDI

	Samoa		Solomon Islands		Timor-Leste		Tonga		Vanuatu	
	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source
<b>Water</b>										
<b>Access</b>										
Improved sanitation facilities (% of population with access)	99	2000 WDI	34	2000 WDI					100	2000 WDI
Improved water source (% of population with access)	99	2000 WDI	71	2000 WDI			100	2000 WDI	88	2000 WDI
<b>Quality</b>										
Availability of water supply ( Hours per day)	24								24	
<b>Tariffs and Costs</b>										
Average Tariff (US\$ per m3)	0.048	2003							0.403	2003
Cost Recovery Ratio										
<b>Efficiency</b>										
Non-Revenue Water (%)	50%	WDI							27%	WDI
% Metered Connections										
Staff per 1000 connections	15	WDI	11	WDI					4	WDI

	Barbados		Dominica		Grenada		Jamaica		Mauritius		Philippines		St. Kitts and Nevis		St. Lucia	
	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year
<b>Water</b>																
<b>Access</b>																
Improved sanitation facilities (% of population with access)	100	2000	83	2000	97	WDI	99	2000	99	2000	83	2000	96	2000	89	2000
Improved water source (% of population with access)	100	2000	97	2000	95	WDI	92	2000	100	2000	86	2000	97.2	2000	98	2000
<b>Quality</b>																
Availability of water supply (Hours per day)	18	2003	24	2003												
<b>Tariffs and Costs</b>																
Average Tariff (US\$ per m3)			1.07	2003			1.5	2003			0.1761				0.96	2003
Cost Recovery Ratio																
<b>Efficiency</b>																
Non-Revenue Water (%)			38%	WDI			65%	WDI							30%	WDI
% Metered Connections			7	WDI			7	WDI							7	WDI
Staff per 1000 connections																

	Fiji		Kiribati		Marshall Islands		Micronesia, Fed. Sts.		Palau		Papua New Guinea	
	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year
<b>Roads</b>												
<b>Access and use</b>												
Roads, paved (% of total roads)	49.2	1999					17.5	1999			3.5	1999
Roads, total network (km)	3,440	1999	670	1999		1999	240.0	1999			19,600	1999
Road Density in Terms of Population (road km/1,000 people)												
Road Density in Terms of Land (road-km/1,000 sq km)												
Vehicles (per km of road)	17.2	1996									5.9	1996
<b>Airports and Aviation</b>												
Air transport, freight (million tons per km)	93.8	2002	0.8	1998	0.3	2002					24.2	2002
Air Transport - Passenger numbers (passengers / year)	647,400	1999	28,300	1999	24,600	2002					1,234,800	2002
Aircraft departures	65,400	1999	3,200	1999	3,900	2002					31,100	2002
<b>Ports and maritime Transport Sector</b>												
Container port traffic (TEU: 20 foot equivalent units)												
Port Charges (Charge AUD for a ship of 18,391 grt and 184.9 m long calling	10219.68	2003										

	Samoa			Solomon Islands			Timor-Leste			Tonga			Vanuatu		
	Data	year	source	Data	year	source	Data	year	source	Data	year	source	Data	year	source
<b>Roads</b>															
<b>Access and use</b>															
Roads, paved (% of total roads)	42	1999	WDI	2.5	1999	WDI			27	1999	WDI	23.9	1999	WDI	
Roads, total network (km)	790	1999	WDI	1,360	1999	WDI			680	1999	WDI	1,070	1999	WDI	
Road Density in Terms of Population (road km/1,000 people)															
Road Density in Terms of Land (road-km/1,000 sq km)															
Vehicles (per km of road)									2.8	1996	WDI	5.6	1996	WDI	
<b>Airports and Aviation</b>															
Air transport, freight (million tons per km)	2.3	2002	WDI	1.1	2002	WDI						2.1	2002	WDI	
Air Transport - Passenger numbers (passengers / year)	182,300	2,002	WDI	84,500	2002	WDI			58,500	2002	WDI	104,300	2002	WDI	
Aircraft departures	12,300	2,002	WDI	13,000	2002	WDI			4,300	2002	WDI	1,500	2002	WDI	
<b>Ports and maritime Transport Sector</b>															
Container port traffic (TEU: 20 foot equivalent units)															
Port Charges (Charge AUD for a ship of 18,391 grt and 184.9 m long calling	3369.6	2003	2	2891.52	2003	2						6826.32	2003	2	

	Barbados		Dominica		Grenada		Jamaica		Mauritius		Philippines		St. Kitts and Nevis		St. Lucia		
	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year	
<b>Roads</b>																	
<b>Access and Use</b>																	
Roads, paved (% of total roads)	98.6	2001	WDI				70.1	1999	WDI	98	2001	WDI			5.2	1999	WDI
Roads, total network (km)	1,600	2001	WDI				18,700	1999	WDI	2,000	2001	WDI			1,210	1999	WDI
Road Density in terms of Population (road km/1,000 people)																	
Road Density in Terms of Land (road-km/1,000 sq km)																	
Vehicles (per km of road)	26.7	1996	WDI				6.6	1996	WDI	64	2000	WDI			13	1996	WDI
<b>Airports and Aviation</b>																	
Air transport, freight (million tons per km)																	
Air Transport - Passenger numbers (passengers / year)							56.6	2002	WDI	189.1	2002	WDI			266.9	2002	WDI
Aircraft departures							2,016,000	2002	WDI	1,024,700	2002	WDI			5,659,600	2002	WDI
<b>Ports and maritime Transport Sector</b>																	
Container port traffic (TEU: 20 foot equivalent units)																	
Port Charges (Charge AUD for a ship of 18,391 grt and 184.9 m long calling	1,065,000	2002	WDI				1,065,000	2002	WDI						3,270,796	2002	WDI

	Fiji		Kiribati		Marshall Islands		Micronesia		Palau		Papua New Guinea	
	Data	year	Data	year	Data	year	Data	year	Data	year	Data	year
<b>GENERAL</b>												
Land area (sq km)	18,270.0	2002	730.0	2002	181.3	2002	436.3	2002	460.0	2002	452,860.0	2002
GDP (current US\$)	1880000000	2002	5340000	2002	106000000	2002	232000000	2002	130000000	2002	2810000000	2002
GDP (Current \$US)	2035787000	2003	54643510	2003	105873600	2003	243127300	2003	125629000	2003	3182093000	2003
Population, total	835000	2002	96000	2002	53000	2002	125000	2002	20000	2002	5502000	2002
Population, total	835000	2003	96377.02	2003	52500	2003	124559.8	2003	20000	2003	5501871	2003
GDP per capita (Current \$US)	2251.497006	2002	556.25	2002	2000	2002	1856	2002	6500	2002	510.7233733	2002
Population density (people per sq km)	45.70334	2003	132.0233	2003	289.5753	2003	177.4355	2003	43	2003	12.14917	2003
Rural population (% of total population)	48.2958	2003	60.4972	2003	33.634	2003	70.652	2003	81.8248	2003	81.8248	2003
Rural population growth (annual %)	-0.1407987	2003	1.045792	2003	-0.5352654	2003	1.290981	2003	1.975227	2003	1.975227	2003
Population growth (annual %)	1.411107	2003	1.75125	2003	0	2003	1.765614	2003	2.274926	2003	2.274926	2003
Education Index	0.86										0.57	HDR
Human Development Index	0.758	2002									0.542	2002
Official Development Assistance (ODA) received, net disbursements (as % of GDP)	1.8	2002	39.1	2002	59	2002	48.1	2002			7.2	2002
GDP per capita growth (annual %)	3.331545	2003	0.7205953	2003	2	2003	0.6078792	2003	0.3900256	2003	0.3900256	2003
Inflation (% annual change in CPI)	2.4	2004	2.3	2004	2	2001	1	2002	3.4	2000	7.4	2004
Cash surplus/deficit (% of GDP)	-9.5	2003	-30.2	2003	-3.1	2004	-6.7	2004	-12.4	2004	-2	2003
Average growth in real GDP per capita, 1999-2003	2.6%	1999-2003	0.9%	1999-2003	0.1%	1999-2003	-0.1%	1999-2003	2.0%	1999-2003		
Percent Population below poverty line (Latest year available)	26.0%	3	51.0%	3	20.0%	3	40.0%	3			37%	2002
Kilometers to nearest major port	3215	2004	4534	2004	4501	2004	3703	2004	1677	2004		
Atlas GNI per capita (\$US 2003)	2360	2003	880	2003	2710	2003	2090	2003	7500	2003		
Average aid per capita (\$US 2003)	40	2004	198	2004	1183	2004	911	2004	2308	2004		
Average population growth (annual %, 1998-2004)	1.1%	1998-2004	2.3%	1998-2004	0.9%	1998-2004	1.9%	1998-2004	1.5%	1998-2004		



	Samoa		Solomon Islands		Timor-Leste		Tonga		Vanuatu	
	Data	year	Data	year	Data	year	Data	year	Data	year
<b>GENERAL</b>										
Land area (sq km)	2,830.0	2002	27,990.0	2002	14,870.0	2002	720.0	2002	12,190.0	2002
GDP (current US\$)	261000000	2002	240000000	2002	388000000	2002	136000000	2002	234000000	2002
GDP (Current \$US)	267911000	2003	252654300	2003	341000000	2003	162692400	2003	283343100	2003
Population, total	178000	2002	457000	2002	810000	2002	102000	2002	210000	2002
Population, total	178000	2003	456844.9	2003	877000	2003	101524.1	2003	210163.7	2003
GDP per capita (Current \$US)	1466.2921	2002	525.16411	2002	479.012346	2002	1333.333333	2002	1114.285714	2002
Population density (people per sq km)	62.89753	2003	16.31457	2003	58.97781	2003	141.0057	2003	17.24067	2003
Rural population (% of total population)	77.1986	2003	78.6184	2003	82.3312	2003	66.494	2003	77.1212	2003
Rural population growth (annual %)	0.6970343	2003	2.288174	2003	5.339516	2003	-0.02366809	2003	1.71918	2003
Population growth (annual %)	1.016384	2003	2.966754	2003	5.267455	2003	0.3560925	2003	2.208476	2003
Education Index	0.89	HDR	0.68	HDR	0.64	HDR	0.93	HDR	0.42	HDR
Human Development Index	0.769	2002	0.624	2002	0.436	2002	0.787	2002	0.57	2002
Official Development Assistance (ODA) received, net disbursements (as % of GDP)	14.5	2002	11	2002	56.6	2002	16.4	2002	11.7	2002
GDP per capita growth (annual %)	2.49008	2003	2.02774	2003	-7.028506	2003	2.135654	2003	-0.227852	2003
Inflation (% annual change in CPI)	2.4	2004	6.8	2004	4.1	2004	11	2004	2.8	2004
Cash surplus/deficit (% of GDP)	-0.9	2004	4	2004			-0.6	2004	0.9	2004
Average growth in real GDP per capita, 1999-2003	3.0%	1999-2003	-7.4%	1999-2003	3		2.1%	1999-2003	-2.4%	1999-2003
Percent Population below poverty line (Latest year available)	20.0%	3		3	4.2%	2003	23.0%	3	40.0%	3
Kilometers to nearest major port	4340	2004	2854	2004			3560	2004	2471	2004
Atlas GNI per capita (\$US 2003)	1600	2003	600	2003			1490	2003	1180	2003
Average aid per capita (\$US 2003)	194	2004	113	2004			214	2004	187	2004
Average population growth (annual %, 1998-2004)	1.0%	1998-2004	2.8%	1998-2004	3		0.6%	1998-2004	2.6%	1998-2004

	Barbados		Dominica		Grenada		Jamaica		Mauritius		Philippines		St. Kitts and Nevis		St. Lucia	
	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year source	Data	year
<b>GENERAL</b>																
Land area (sq km)	430.0	2002 WDI	750	2002 WDI	340	2002 WDI	10,850.0	2002 WDI	2,030.0	2002 WDI	298,170.0	2002 WDI	360	2002 WDI	610.0	2002
GDP (current US\$)	2530000000	2002 WDI	247,566,700	2002 WDI	414,148,100	2002 WDI	7870000000	2002 WDI	4530000000	2002 WDI	78000000000	2002 WDI	356,259,300	2002 WDI	660000000	2002
GDP (current \$US)	2626829000	2003 WDI	259,148,100	2003 WDI	43925800	2003 WDI	8147420000	2003 WDI	5223977000	2003 WDI	80573850000	2003 WDI	345525900	2003 WDI	66277800	2003
Population, total	271000	2002 WDI	72,000	2002 WDI	102,000	2002 WDI	2640000	2002 WDI	1225000	2002 WDI	81500000	2002 WDI	46,000	2002 WDI	160588	2002
Population, total	270584	2003 WDI	71212.83	2003 WDI	104600	2003 WDI	2642628	2003 WDI	1222188	2003 WDI	81502620	2003 WDI	46710	2003 WDI	160588	2003
GDP per capita (Current \$US)	9335.793358	2002 WDI	3639.064758	2003 WDI	4199.419694	2003 WDI	2981.060606	2002 WDI	3697.989184	2002 WDI	957.0552147	2002 WDI	7397.257547	2003 WDI	4109.8961	2002
Population density (people per sq km)	629.2651	2003 WDI	94.95044	2003 WDI	307.6471	2003 WDI	244.01	2003 WDI	602.0632	2003 WDI	273.3428	2003 WDI	129.75	2003 WDI	263.259	2003
Rural population (% of total population)	48.3468	2003 WDI	27.9728	2003 WDI	60.44811	2003 WDI	42.4328	2003 WDI	57.7336	2003 WDI	39.0314	2003 WDI	65.3224	2003 WDI	61.4472	2003
Rural population growth (annual %)	-0.6984047	2003 WDI	-1.00576	2003 WDI	0.1513626	2003 WDI	-0.3307036	2003 WDI	0.4498607	2003 WDI	-0.1188159	2003 WDI	-0.281193	2003 WDI	0.4930409	2003
Population growth (annual %)	0.4444627	2003 WDI	0.188104	2003 WDI	1.062802	2003 WDI	0.8201605	2003 WDI	1.002263	2003 WDI	1.930593	2003 WDI	0	2003 WDI	0.9101748	2003
Education Index	0.95	HDR	0.76	HDR	0.85	HDR	0.83	HDR	0.79	HDR	0.89	HDR	0.98	HDR	0.88	
Human Development Index	0.888	2002 HDR	0.743	2002 HDR	0.745	2002 HDR	0.764	2002 HDR	0.785	2002 HDR	0.753	2002 HDR	0.844	2002 HDR	0.777	2002
Official Development Assistance (ODA) received, net disbursements (as % of GDP)	0.1	2002 HDR	12.1	2002 HDR	2.3	2002 HDR	0.3	2002 HDR	0.5	2002 HDR	0.7	2002 HDR	8	2002 HDR	5.1	2002
GDP per capita growth (annual %)	0.8735738	2003 WDI	-0.8191337	2003 WDI	4.640776	2003 WDI	1.427231	2003 WDI	2.17083	2003 WDI	2.516906	2003 WDI	0	2003 WDI	0.8289172	2003
Inflation (% annual change in CPI)	1.5	2004 IMF	2.3	2004 IMF	2.3	2004 IMF	11.5	2004 IMF	4.4	2004 IMF	5.5	2004 IMF	2.4	2004 IMF	1	2004
Cash surplus/deficit (% of GDP)	-0.5931095	2003 WDI					-7.9	2003 WDI	-3.386534	2003 WDI	-3.90619	2000 WDI	1.16753	1994 WDI		
Average growth in real GDP per capita, 1999-2003					32%	2000 CIA	20%	2002 CIA	10%	2001 CIA	40%	2001 CIA				
Percent Population below poverty line (Latest year available)					2420	2004 Caribbe	933	2004 Caribbe								
Kilometers to nearest major port	2582	2004 Caribbe														
Atlas GNI per capita (\$US 2003)																
Average aid per capita (\$US 2003)																
Average population growth (annual %, 1996-2004)																2412

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