
New heights of success for Tonga's aviation and tourism

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Abstract

Tourism is the main economic sector for Tonga, generating more than 100 million Tongan pa'anga (dollar) (TOP) in tourism expenditures in 2015 to the Kingdom's economy (Tonga Reserve Bank estimates, January 2016). However the industry remained stagnant during the decade 2003-2013, caused primarily by a combination of political instability and events. The demise of the national carrier, Royal Tongan Airlines, in 2004 put aviation in Tonga on hold, resulting in very limited regional and no domestic services for a few months. Political unrest and the subsequent burning of the capital city, Nuku'alofa, in 2006 added more problems to Tonga's struggling economy. The global recession of 2009 greatly affected travel demand to the region, Tonga included. Lack of aviation and tourism infrastructure development during the period was another concern.

Recent grants from various international agencies for major much-needed infrastructure projects, political reforms, changes in key policies, introduction of low cost carrier services operating under new air services agreements, all played a pivotal role in the recovery effort. Recent hotel rooms' expansion and overall improvements to the tourism industry, complement development in the aviation front.

This study evaluates these issues, strategies and policies, based on recent analysis of government aviation policies, assessment of infrastructure and development projects, and the industry investment and development plan. Recent consultation and workshops were conducted in Tonga on these issues, with stakeholders both within the public and private sector. Events that may have been responsible for the stagnant period in aviation and tourism in Tonga from the decade 2003-2013 were analysed, shedding

new information on the road to recovery. The outcome is that Tonga's aviation and tourism sector looks set to take off in the near future.

Keywords: tourism development, infrastructure development, government policies, aviation growth

A list of acronyms used is at the end of this article.

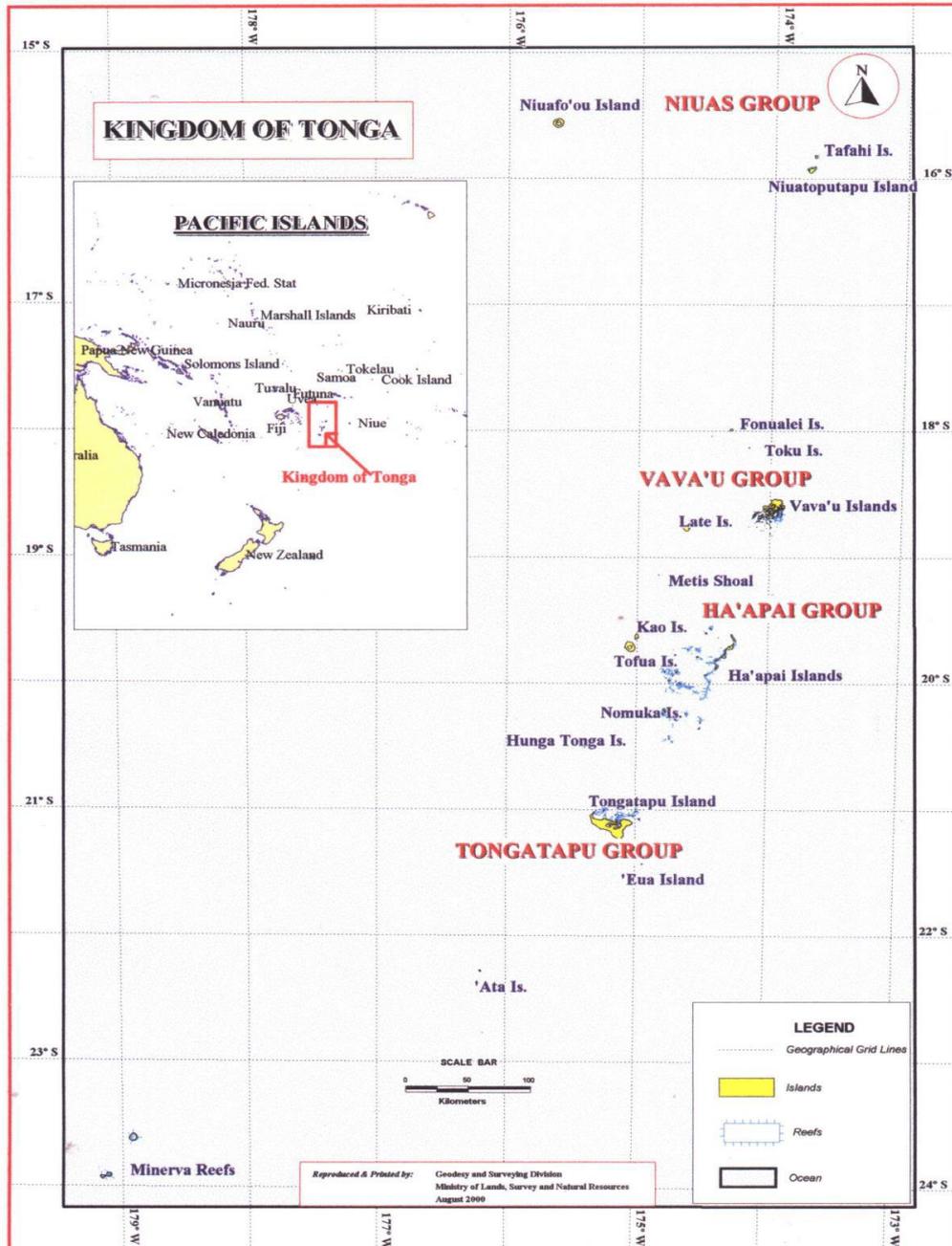
Introduction

This study evaluates issues and policies that may have acted as barriers for the growth of the aviation sector in Tonga during the decade 2003-2013. Tourism development went through a similar stagnant period as well. This was partly caused by the associated aviation crisis, as well as other factors such as the lack of capital and infrastructure investment in the tourism industry, and other policies and political issues that seem to affect tourism growth. However, recent changes in policies, strategies, political restructuring, and increased infrastructure development seem to overcome barriers, showing some early positive signs of growth both in aviation and tourism. Barring any more national and global shocks (such as natural disasters and economic recessions), tourism and aviation are both set to take off up to 2020.

On the regional scene, most Pacific Island Countries (PICs) give top priority to tourism development as it appears to be the only economic sector offering long-term potential for growth. Possibilities for economic growth in nearly all PICs are limited because they are small in size and population, are geographically isolated (see Figure 1), lack natural resources, have under-developed infrastructure, and their domestic markets alone do not justify frequent air traffic. As a consequence, airlines, who are the main distributors of tourists in the region, cannot make economies of scale and operate with low load factors, making airline operations even more economically unsustainable (Taumoepeau & Kissling, 2008; Murray, Murray & Taumoepeau, 2010). Problems are compounded because in developed countries, the source of most PIC tourists, airport charges are high, as are costs of fuel, spare parts, and replacement aircraft, whether leased or purchased. In view of such constraints, Pacific Island airlines options are thus limited. Partnerships with regional airlines are one possibility, while another

is to facilitate low cost carrier (LCC) services (such as was the case in Samoa in the early 2000s) and a move from a bilateral regime towards a more liberal aviation policy. At the national level, governments, for a variety of reasons, are often unable to put in place the appropriate aviation policies with associated infrastructure. Tourism flourishes once there is a conducive aviation environment in place as in the case of Fiji aviation.

Figure 1: Map of the Tongan Islands in the South West Pacific



Source: Tonga on the Millennium Development Goals, (2015)

Tourism and aviation

Tourism in the region depends on a viable air transportation system for its continual growth. Needless to say, Tonga's air transport sustainability relies heavily on a growing tourism sector (Tonga Ministry of Transportation, 2015). These two sectors for more than a decade (2003-2013) went through a stagnant period mainly caused by a combination of factors such as low investment in the tourism sector, the costly operation of the national carrier (Royal Tongan Airlines) at the time followed with the cessation of operation in 2004, and the subsequent costly aftermath left by the national carrier exit. Both regional and domestic services became very unstable with temporary licenses issued to several airlines. These were coupled with deteriorating aviation and airport infrastructure, and the need to modernise traditional bilateral air services agreements¹ with neighbouring countries.

Taumoepeau (2015) highlighted some of the reasons why many airlines in the region (Tonga included) were not financially sustainable (and others have gone bankrupt). They included remoteness and length of distances between islands and airfields; limited size of the markets and low volume; very high operational costs and aircraft leasing; restrictions on Sunday operations of some airports and air services; high airport charges; traditionally low load factor; and some necessary thin sectors were not economically sustainable.

These regional airlines are very sensitive to economic fluctuations and high oil prices. Most Pacific airlines pay major expenses such as aircraft leasing, spare parts and maintenance costs and fuel in the strong US currency, but their earnings are in very soft currencies in the region. A direct result is a very low profit margin for Pacific airlines. Given the unique features of air services in the region, and for airlines to be economically sustainable and to support the viability of airports, the aviation sector demands flexibility in operational hours, scheduling, and to dovetail to mainstream traffic demand.

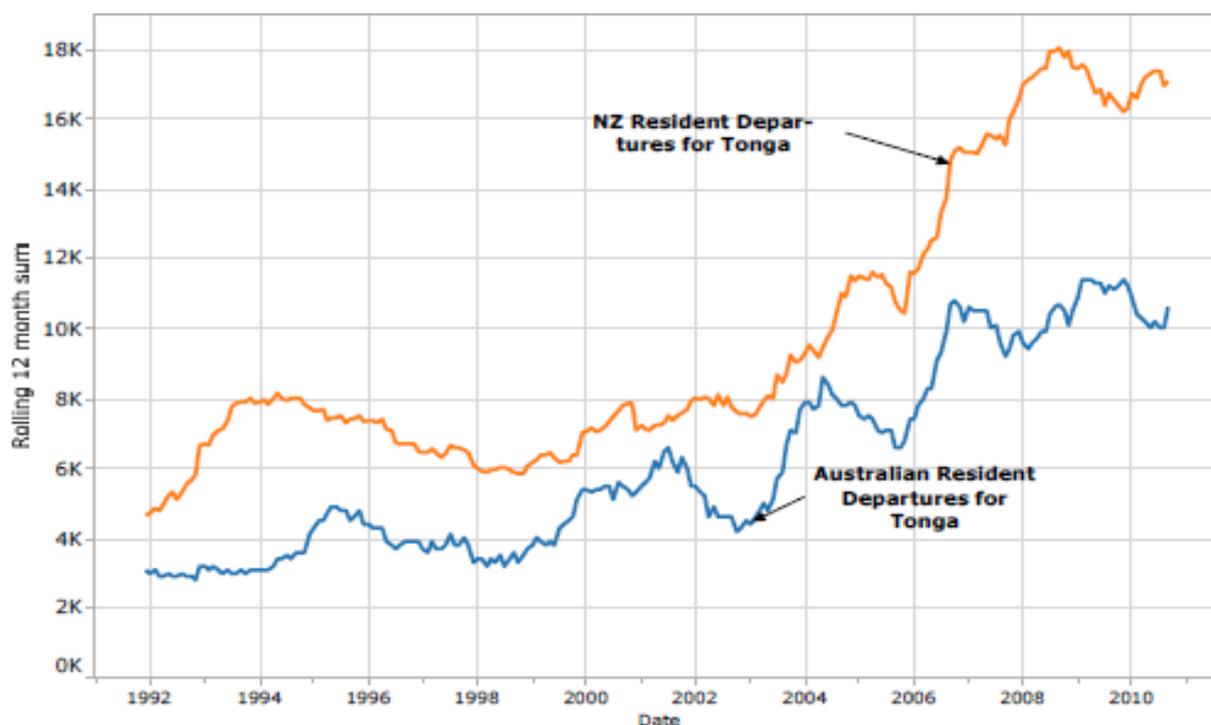
Arrival of low cost carriers

During the past few years, the LCCs² such as Pacific Blue (Virgin Australia), Jetstar and Air New Zealand (operating a similar model since it merged with its low-cost subsidiary Freedom Air) have played a significant role in

bringing the Visiting Friends and Relatives (VFR) market segment and leisure traffic to the islands of the South Pacific.

The increased visitor numbers to these islands not only translate into a significant and tangible return to the community through increased tourism and economic benefits, they have also prompted renewed interest from developers keen to invest in infrastructure, such as in hotel chains, to support the growing tourist numbers in the region. Figure 2 shows the immediate impact of the LCC model on visitor numbers to Tonga from the main market countries, Australia and New Zealand, when Pacific Blue started flying into Tonga, resulting in a sizeable increase in air visitors. However, political instability and the 2006 riot in Nuku'alofa slowed down travel traffic until the 2008 Royal Coronation which gave an incremental rise in tourism during that year.

Figure 2: Australia and New Zealand short-term departures to Tonga



Source: Australia and New Zealand Statistics Report

Domestic air services: A decade of uncertainty

Since the demise of the national carrier in 2004 and the associated grounding of the domestic service for many months, tourism in the outer islands of

Tonga has ceased. A sustainable domestic air service to the outer islands of Vava'u, Ha'apai, Eua, Niuatoputapu and Niuafu'ou (see Figure 1 for the islands' geographical positions) is essential for both tourism and to facilitate economic activities. Several airline companies, under some hastily arranged services agreements, came in to fill the vacuum left by the national carrier. However, they were confronted with several problems in aviation regulations, the wrong types of aircrafts for some routes and small existing runways, and other technical and economic problems. The domestic air services were struggling to operate financially, with escalating fuel prices and rising operational costs from its fleet of different aircraft and a stagnant domestic and tourism market.

Tongan domestic air services thus went through a decade of uncertainty from 2003 to 2013. Routes were operated by several airlines, with different types of old aircraft, after the collapse of Royal Tongan Airlines in 2004. Operators such as Fly Niu, Peau Vava'u and Airlines Tonga came into operation between 2004 and 2008. Each airline would cease operation after flying for a couple of years. In April 2008, Chathams Pacific, a subsidiary of Air Chathams Ltd, commenced operation domestically and by September of the same year became the sole air service operator. The airline served six airports: Vava'u, Ha'apai, 'Eua, Niuatoputapu and Niuafu'ou. Chathams Pacific has a fleet of six aircraft—one Convair CV580 and one Metroliner (operating to Vava'u), one DC3 (operating to Ha'apai), two Queen Airs (to Niuafu'ou and Niuatoputapu), and one Islander (operating to 'Eua). With such a mix of different types of aircrafts, fleet maintenance and operations were not without logistical problems.

Real Tonga took over the domestic services previously operated by Chathams Pacific in 2013. This airline started up with two aircraft, MA60⁴ and Y12⁵ aircraft donated by China to the Tongan Government. The use of the MA60 generated controversy in both Tonga and New Zealand due to the lack of a suitable and satisfactory certification process in accordance with the regional Pacific Aviation Safety Organisation (PASO) and the New Zealand Civil Aviation Authority rules and procedures. Consequently, the New Zealand government issued a travel advisory, warning against air travel in Tonga, which did not help tourism at all. As a result of this, tourist numbers dropped, particularly on the outer islands, where the reduction in the number of tourists had a significant impact on the local economy. In 2014,

the controversy with the MA60 was partly settled with Real Tonga purchasing two Jetstream 32 aircrafts; they have since returned the MA60 to the Chinese government. At the same time, Air Pacific (renamed Fiji Airways, FJ) announced their plan to fly domestically within Tonga and also operate their ATR72⁶ directly between Nadi and Vava'u.

As discussed in the earlier section, the international tourist demand for Tonga as a holiday destination slowed down considerably during the period 2003-2013, mainly caused by the demise of the national carrier, Royal Tongan Airlines in 2004, uncertainty in the situation of the domestic air service, political instability, global recession and fuel price fluctuations, which seems to affect Tonga more than the other island economies, and a lack of suitable infrastructure, and new tourism investment in the sector. The overall number of air arrivals remained stagnant at just under the 50,000 level during those years, even though the LCC services started servicing the islands, Tonga included. The average national annual hotel room occupancy was estimated to be under 50% (Tonga Ministry of Tourism, 2013).

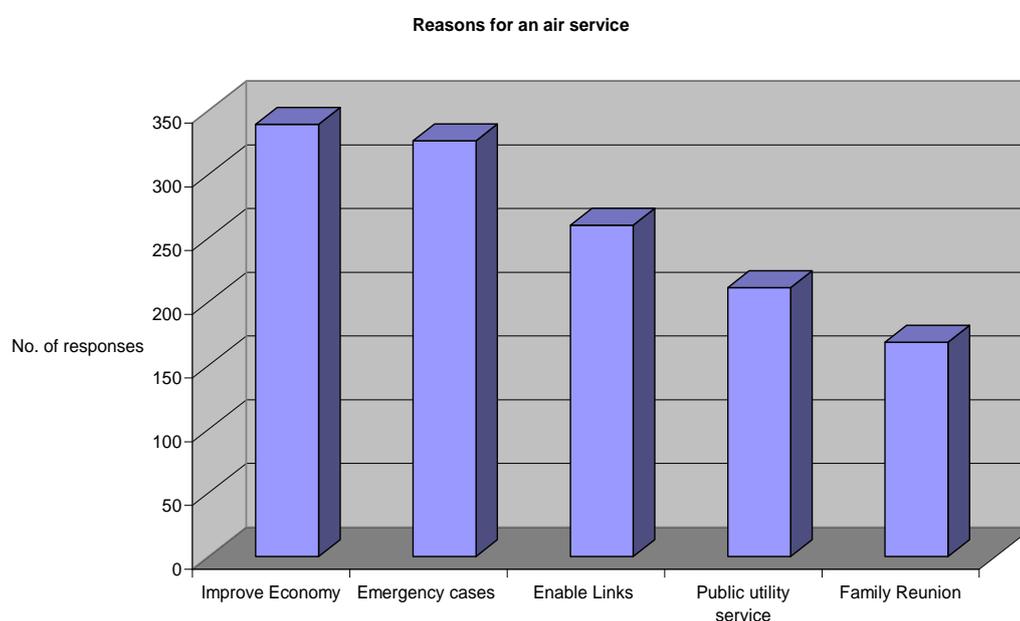
Despite the benefits, and emphasis on various strategies and plans, that these two sectors (and the only financial saviour within the immediate horizon) bring to the country annually, their specific and unique requirements seemed to be neglected during the early 2000s. More foreign exchange for the country, more revenue for the government departments and the ability to create more jobs for Tongans could have been achieved.

The stringent enforcement of the Sunday closing law in relation to transportation serving the general public and tourists alike is counterproductive to the effort of the people of Tonga and Government to improve the economy of the Kingdom, with perhaps minimum impact on the essentials of Christian principles. Travelling on weekends (especially on Sundays) for religious purpose is practised in all countries of the world. Views expressed by some church leaders consulted seemed to favour the easing up of restrictions on both land and air transport, to enable and facilitate movements of Tongans and visitors alike.

It was estimated that the opportunity cost to the Tongan economy, due to the restrictions on Sunday transportation, exceeds TOP100 million annually (Taumoepeau, 2012).

In a previous study (Graham, Papatheodorou, and Forsyth, (2008), stakeholders were surveyed (n=820 passengers) in Tonga on their perception on why they think domestic air services are important for Tonga. Nearly two-thirds (64%) ranked economic development as the highest priority. Figure 3 summarises the findings from the survey. It can be seen clearly from this national survey that the majority of the population wish to see Tongan aviation policy work towards the improvement of the economy, and to facilitate domestic and international travel connections with the general public.

Figure 3: Tonga air services essentials for economic growth



Upgrading of Tongan airports

Aviation and airports in Tonga were under the Ministry of Aviation until 2007. The Tongan Government went ahead and established a commercially run Tonga Airports Limited in 2007, under the governing legislation of the Public Enterprises Act 2002 (Kissling, 2002), and the authority granted under section 5 of the Civil Aviation Act 1990. Tonga Airports Limited (TAL) (2015) operates the six airports of Tonga, and is accountable to the standards and regulations of the Civil Aviation Act 1990, to New Zealand Civil Aviation laws and the International Civil Aviation Organization guidelines. During the period from 2010 onwards, major improvements have been witnessed. New navigational instruments and equipment have been installed or acquired, such as a new Precision Approach Path Indicator (PAPI), back-up emergency generators for Fua'amotu and Vava'u, a new Category 8 Rescue

Fire vehicle, new navigational equipment DVOR/DME⁷, as well as funding to support major runway projects at Fua'amotu, Vava'u and Ha'apai airports. A regulatory compliance milestone was the Part 139 aerodrome certification, vital to their safety management system. These are some examples of ongoing investment and very high cost maintenance operation going on weekly at the six airports throughout Tonga.

Another development was that TAL was able to collect the upper airspace charges⁸, and this goes towards the running and technology to support the service. When TAL was set up, it was also used to offset the outer island operations. Tongan aviation has been a signatory to ICAO and PASO, and is committed to its aeronautical roles and responsibilities, and the continual upholding of safe and reliable aviation practices in Tonga and in the region. The Tonga Transport Sector Consolidation Project (TTSCP), sponsored by the World Bank, has identified the aviation and airport sector as a priority area, in recognition of the key role of air transport in the economic future of Tonga. Extension of opening hours, by allowing Sunday flights internationally and domestically, will certainly attract new flights, additional tourism traffic and higher expenditure from visitors as well as generating much needed revenue for TAL, which will certainly help with the maintenance and continual upgrading of airfields.

The consolidation phase

Recently, Tonga has been in the forefront of some major improvements and changes to its aviation policies, and restructured its Aviation Ministry, Airport Authority and infrastructural development. It has opened up some traditional air services agreements, becoming more flexible dovetailing to market demand. This has encouraged LCCs to enter the market, and improvement in air services (in capacity, frequency and new routes) and privatisation of the domestic air services. There have been generous injections from the Asia Development Bank (ADB), the World Bank and other international and bilateral aid organisations for infrastructure development (more than US\$60 million), and for the completion of the submarine cable system (827 km long) from Fiji in June 2013. Upgrading of the main Fua'amotu international airport and all the outer islands' airports, airport building infrastructure, runway strengthening and widening,

improved navigational aids, as well as the establishment of commercially oriented organisational structures, have taken place.

However, recent commencement of the Fiji Airways twice weekly service from the Nadi gateway to the tourism capital of Tonga, Vava'u is bound to increase tourism and more visitors for the Vava'u whale-watch attractions.

Table 1 shows number of tourism arrivals breaking the 50,000 threshold in 2014, resulting in a 7% growth rate as compared to the average growth rate of 1-2% during the past 10 years. All other key tourism indicators are showing signs of improvements and the industry consolidating.

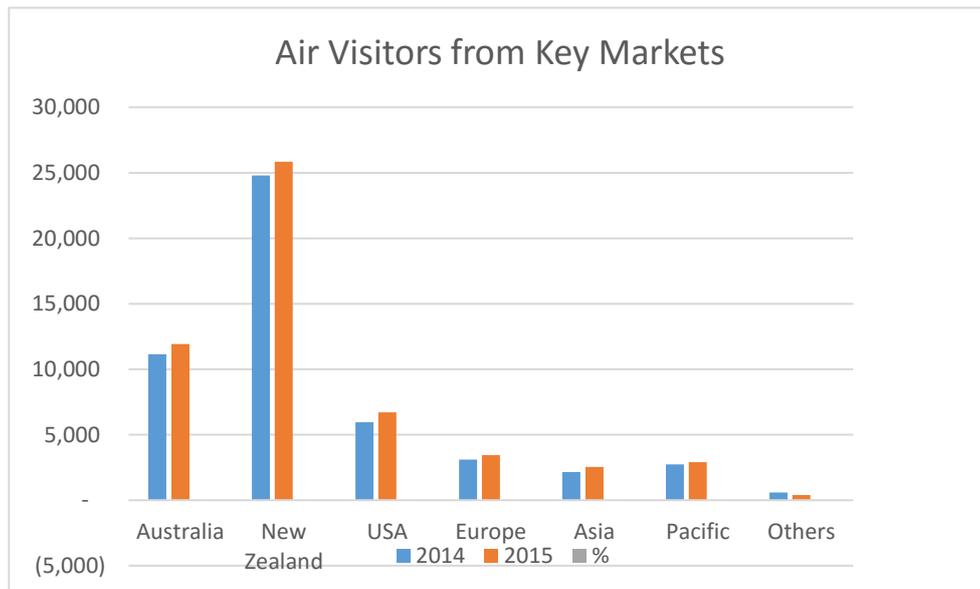
Table 1: Tonga tourism key indicators⁹

| | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|--------|--------|--------|--------|--------|
| Air visitors | 46,000 | 47,500 | 48,200 | 50,000 | 55,000 |
| Excursionists | 20,500 | 8,000 | 9,400 | 12,000 | 14,000 |
| Air arrivals (visitors, VFR and returning residents) | 68,400 | 57,200 | 59,700 | 70,200 | 88,185 |
| Yacht arrivals | 1,800 | 1,800 | 2,000 | 2,200 | 2,400 |
| National hotel room occupancy | 45% | 45% | 45% | 45% | 48% |
| Tourism/Travel receipts (TOP in millions) | 56.0 | 68.7 | 83.3 | 64.4 | 100.0 |
| Jobs (est) (Direct and indirect employment) | 1,800 | 1,900 | 2,050 | 2,100 | 2,500 |
| Estimated economic benefits from the tourism industry to Tonga (TOP millions) (economic multiplier of 1.6) | 90.0 | 110.0 | 133.0 | 103.0 | 160.0 |
| Travel & Tourism GDP Total contribution estimates (%) | 10 | 12 | 15 | 17 | 20 |

Sources: Taumoepeau (2015), Tonga Reserve Bank (2015), Tonga Ministry of Tonga (2013), Tonga on the Millennium Development Goals, (2015)

An analysis of the current source markets for Tongan tourism shows that both New Zealand and Australia will continue to be the main suppliers of tourism and VFR traffic for Tonga up to 2020. Figure 4 shows that, with direct and frequent services (a total of ten flights a week) from the gateways of Auckland and Sydney, served by both Air New Zealand and Virgin Australia, a major portion of the tourist market (70%) comes from these two countries.

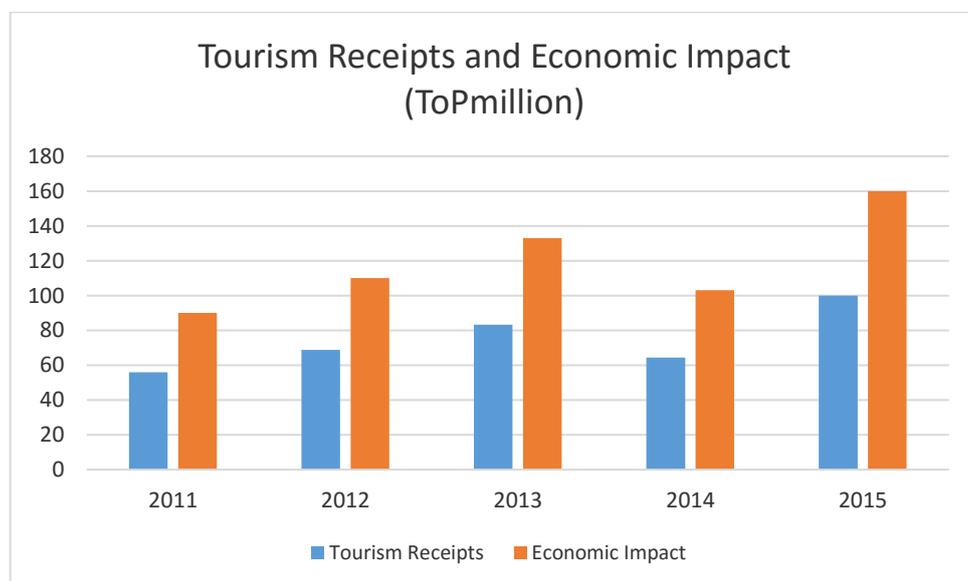
Figure 4: Air visitors from key markets 2014- 2015



Source: Tonga Tourism Authority, 2015

Associated increases both in the level of tourist expenditures and contribution to the local economy in 2015 were recorded as shown in Figure 5.

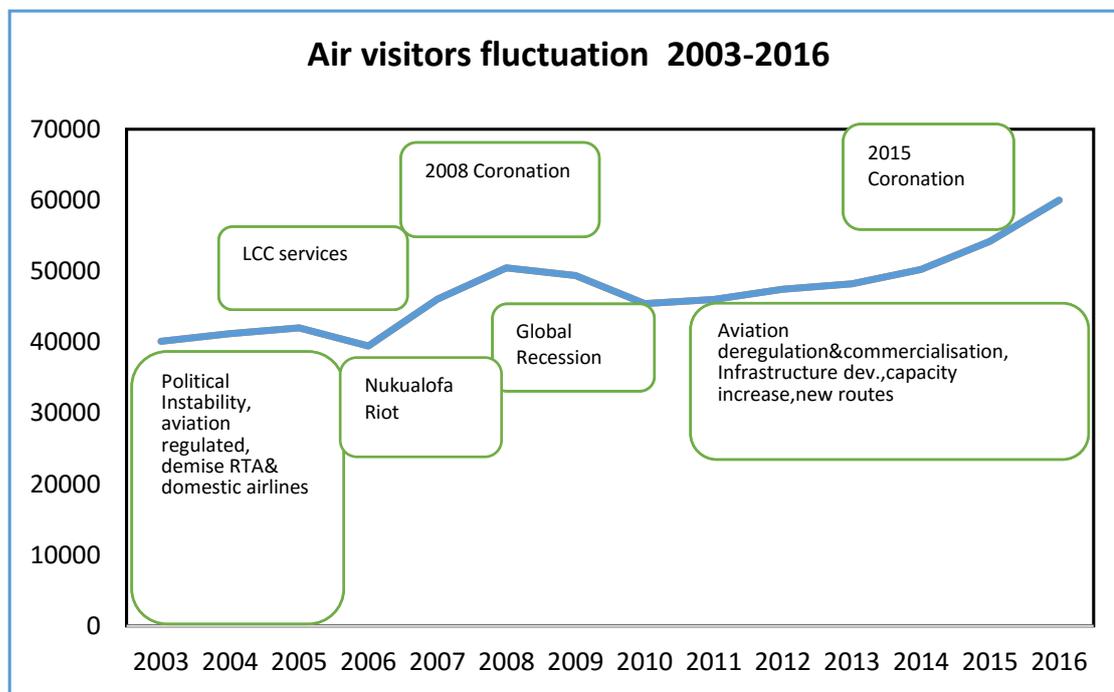
Figure 5: Tourism receipts and economic impact (TOP million)



Source: Tonga Tourism Authority, 2015

Figure 6 highlights how political situations and various events during the period 2003-2013 have affected the level of inbound traffic into Tonga, depicting a decade of fluctuation of tourism arrivals.

Figure 6: Air visitors fluctuation 2003-2016



Source: Analysis and compilation of events by the author

The important events are:

- 1 Political and aviation instability, 2003-2006. The Nuku'alofa riot of 2006, the commencement of the democracy movements from the Monarchy system, the demise of the national airline (Royal Tongan) which grounded all the domestic services throughout Tonga caused widespread unsettled problems in the country with people blaming the government at the time for mismanaging the affairs of the national airline which was seen to be performing well at the beginning of the new millennium.
- 2 Introduction of the LCC services 2005-2007
- 3 The Royal Coronation 2008.
- 4 The Global Recession 2009-2010
- 5 The Consolidation of services, infrastructure, capacity and frequency improvement
- 6 The Royal Coronation 2015 and the Development phase.

Development phase

As early as 2013, the tourism sector, has shown signs of some growth, guided by the TRIP Consultants, (2013) Recent data and projections show signs of tourism recovery; this is based on several recent reports, including Tonga Tourism Statistics (2012-2015; see Tonga Tourism Authority, 2015), Tonga Ministry of Labour, Commerce and Industries (March 2015), as well as most recent analysis and consultation meetings with key stakeholders during January 2016 both in Nuku'alofa and in Vava'u.

The tourism sector has achieved an unprecedented level of TOP100 million in 2015 from travel and tourism receipts as estimated by Tonga Reserve Bank (2015). More than 55,000 air visitors and 24,000 cruise ship excursionists arrived at the Kingdom during 2015 with encouraging forecasts for the next few years. The recent Royal Coronation of their Majesties in July 2015 gave tourism another increase during the year. A 125-room four-star Tanoa International Dateline hotel (former Dateline hotel) is being renovated and expanded along the waterfront of Nuku'alofa, in addition to the 85-room four-star Scenic Hotel property at Fu'amotu airport, which is expected to be completed by 2016, boosting additional international hotel room stock by more than 200 rooms in Tongatapu, thus paving the way for more tourism benefits for the Kingdom. Other recent key developments in the tourism industry include the completion of the Vuna wharf cruise ship terminal, the establishment of the private sector-led Tourism Authority in 2013, and the building of several smaller resorts and lodges. Tourism contributions to the GDP have increased steadily from about 10% in 2010 to more than 20% in 2015 (Tonga on the Millennium Development Goals, 2015).

The open sky policy with New Zealand, arrival of low-cost operations operated by Virgin Airlines (initially under Pacific Blue), and lately aviation infrastructure development projects in place, airfield development throughout Tonga, and commercialisation of the aviation service at the airports have paved the way for a more commercially oriented aviation industry (Taumoepeau, 2010a, Taumoepeau, 2013) . The creation of a private sector-led Tonga Tourism Authority for marketing and product development, and the establishment of a Ministry of Tourism has streamlined effort to focus primarily on issues to further development and make more resources available to open up the tourism sector for more investment. By the end of 2016, more than 90 licensed accommodation

facilities with approximately 1,000 rooms (Tonga Mark one-star to four-star facilities) will be in operation. Recent completion of the new cruise ship terminal (Vuna wharf) has managed to attract more ships to Tonga during the past 2 years (Figure 7).

Figure 7: Vuna wharf cruise ship terminal



Photograph: Tonga Tourism Authority 2015

The completion of the Tonga Mark quality system in 2015, setting a star rating system and improving the quality and services in the tourism industry, should provide the platform for improved services and standards (Tonga Tourism Authority, 2015). Another milestone witnessed in early 2016 was the upgrading (strengthening and widening) of the runway and turning apron at Fu'amotu airport, thus enabling Air New Zealand's Boeing 777-200 (312-seater) to land in Tonga (Figure 8). This increases the capacity (Table 3) from Tonga's most important gateway, Auckland International Airport. The number of weekly flights to Fua'amotu airport has increased from 13 flights a week in 2011 to 20 flights weekly in 2016 (Table 2).

Figure 8: Air New Zealand B777 arrives at Fua'amotu Airport, 1 April 2016



Photograph: Tonga Tourism Authority 2016

Table 2: Number of airplane seats per sector per week, April 2016

| Flights | DJ/VA | NZ | FJ | Ave. no. seats (20 flights) |
|------------------|-------|-------|-----|--------------------------------|
| From AKL | 360 | 1,100 | | 1,460 |
| From SYD | 360 | | | 360 |
| From SUV | | | 120 | 120 |
| From NAN/VAV/TBU | | | 300 | 300 |
| Total | 720 | 1,100 | 420 | 2,240 |

It is confidently expected that this will enhance tourism arrivals from the Auckland gateway (the biggest South Pacific hub for international visitors) by at least 10% annually for the next five years. The increased seat and cargo capacity is beneficial to the industry, especially during the peak periods.

Aviation and tourism set to take off

With development projects completed, and the ongoing improvements and investment, it is confidentially forecast that the total air arrivals to the Kingdom could exceed 140,000 and air visitors 86,000 by the end of 2020 (Figure 9). These arrival figures would mean expenditures could reach an

unprecedented level of TOP 160 million and the economic impact on local economy could exceed TOP 258 million. As usual, the forecast could improve or decrease depending on other variables including natural disasters, global economies, fuel price fluctuation, ongoing government policies and the level of investment both from the public and private sector, and also on the political stability of the country.

Figure 9: Total air arrivals and visitors forecast for 2020

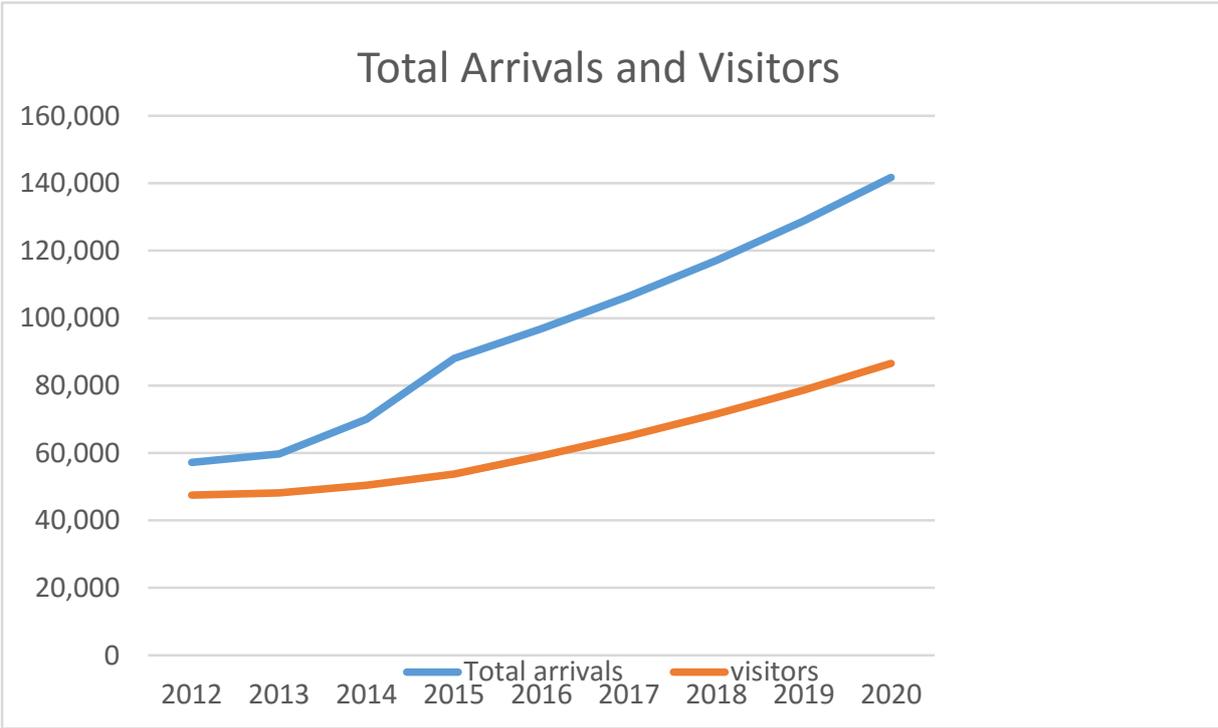
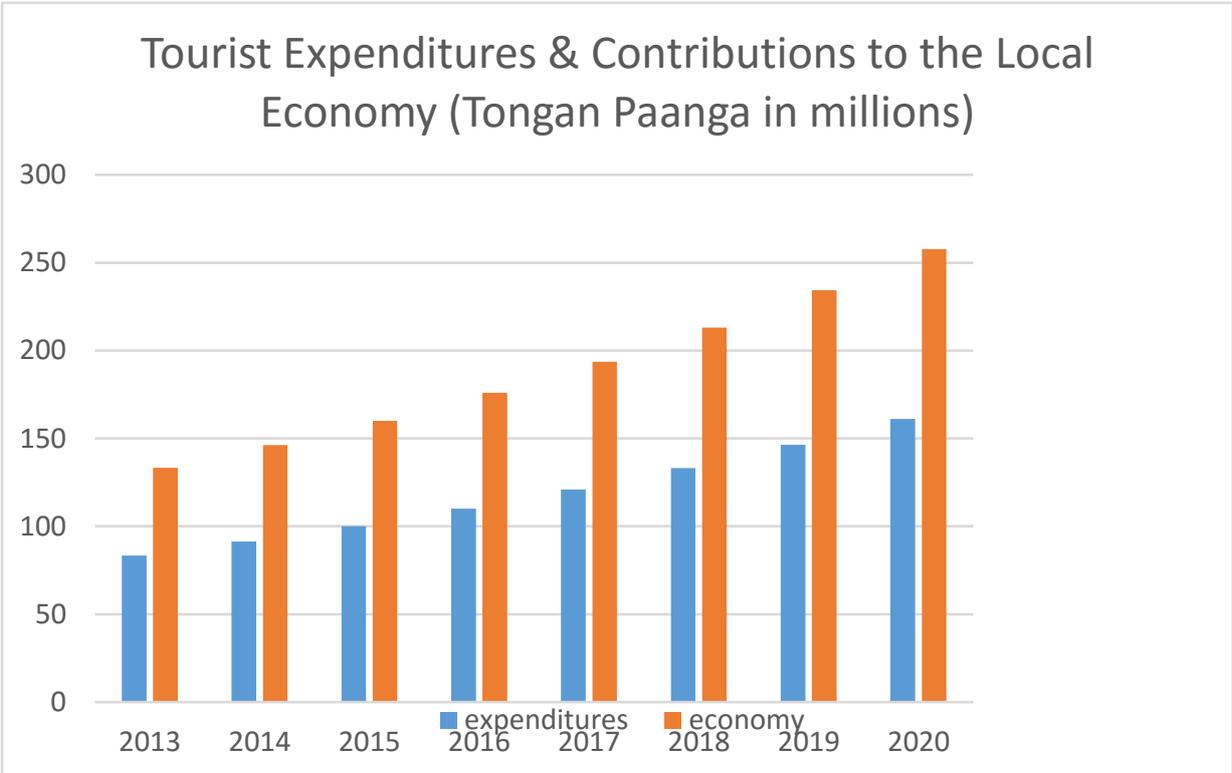


Figure 10 shows the steady tourism expenditures and impact on the local economy 2013 - 2020.

Figure 10: Tourism expenditures and impact 2013 – 2020



Future studies

In order to try and maintain this growth momentum, new strategies and policies conducive for further growth need to be investigated and monitored. These include the possibility of applying strategies that seem to work in Tonga to other neighbouring and similar tourism destinations. Guidelines and strategies for sustainability must be updated, for both the aviation and tourism sector in Tonga. Future projects and expansion programmes should dovetail to the current regional and global strategies for mitigation of adverse and environmental impacts caused by rising sea level and global warming effects, especially in coastal areas. Sustainable management for both aviation and tourism ought to be on the priority list for all PICs in the South Pacific. The PICs’ economies, after all, depend heavily on sustainable management of natural resources, which are at the heart of tourism development in the future, not only for Tonga but also for the whole South Pacific region.

Notes

- 1 Traditionally bilateral air services, under the International Civil Aviation Organisation (ICAO) protocol, between Tonga and her neighbouring countries (including New Zealand and Australia) were in place to look after Tonga's national carrier rights. With the demise of the national carrier, Tonga recently moved towards multilateral and open sky policies to facilitate more services from foreign carriers such as Air New Zealand, Fiji Airways and Virgin Australia.
- 2 The economic crisis of the early 1990s has partly forced some of the countries to liberalise their bilateral aviation policies and started a revolution in the global aviation market. It effectively opened up new air services and removed government control (Doganis, 2006; Taumoepeau, 2010b). Countries were quick to recognise the potential commercial benefits from the market deregulation process (Graham et al, 2010). The LCC model tends to overhaul and simplify processes, such as one-type aircraft fleet structure, higher aircraft utilization and lower distribution costs to improve efficiency.
- 3 The Douglas DC-3 is a fixed-wing propeller-driven airliner built in the 1940s, can carry 20 passengers and is hardly used nowadays. Its lasting effect on the airline industry and World War II makes it one of the most significant transport aircraft ever made.
- 4 The Modern Ark 60 is a turboprop-powered airliner produced by China's Xi'an Aircraft Industrial Corporation under the Aviation Industry Corporation of China (AVIC).
- 5 The Harbin Y-12 is a 19-passenger high wing twin-engine turboprop utility aircraft built by the Harbin Aircraft Industry Group (HAIG).
- 6 The ATR 72 is a twin-engine turboprop short-haul regional airliner manufactured by the French-Italian aircraft manufacturer ATR. It has been typically employed as a regional airliner. Successive models of the ATR 72 have been introduced. A single aircraft can seat up to 78 passengers in a single-class configuration.
- 7 DVOR/DME refers to a combined radio navigation station for aircraft, which consists of two radio beacons, placed together, a VHF omnidirectional range (VOR) and distance measuring equipment (DME). VOR produces an angle between the station and the receiver in the aircraft, while DME does the same for range.

- 8 A regional agreement with Fiji and New Zealand was responsible for the airspace charges being collected on a regional basis by them, before TAL was set up.
- 9 Definitions:
- **Air visitors** are defined under the UNWTO to include air visitors arriving in Tonga for leisure, business, visit friends and relatives and for other purposes, but not for permanent employment or migration in Tonga
 - **Excursionists** are visiting passengers on cruise ships staying for less than 24 hours (they normally do not use accommodation facilities but they utilise facilities and services)
 - **Air arrivals** are all international passengers who disembark at any airport and consist of air visitors and returning residents.
 - **Tourism/Travel receipts** are defined and provided by the Reserve Bank. An economic multiplier ratio of 1.6 has been used (Milne, 2008) to give estimates of the economic impact of tourism based on official tourism expenditure data.
- 10 Airlines during the high season may change the aircraft seat configuration or fly a bigger capacity aircraft to accommodate demand, for example, a switch from A320 to a B767 or 777 in the case of Air New Zealand and from an ATR72 to a B737 in the case of Fiji Airways.

List of acronyms

| | |
|------|---|
| ADB | Asian Development Bank |
| AKL | Auckland, New Zealand |
| AVIC | Aviation Industry Corporation of China |
| DJ | Pacific Blue/Virgin Blue |
| DME | Distance measuring equipment |
| DVOR | Doppler VHF omnidirectional range is a navigational aid that is used to help the aircraft The Doppler VOR is the second generation VOR, providing improved signal quality and accuracy. |
| FJ | Fiji Airways |
| GDP | Gross Domestic Product |
| HAIG | Harbin Aircraft Industry Group, China |
| ICAO | International Civil Aviation Organisation |
| LCC | Low Cost Carriers |
| MA60 | Modern Ark 60 (Chinese made aircraft) |

| | |
|-------|--|
| NAN | Nadi, Fiji |
| NZ | Air New Zealand |
| PAPI | Precision Approach Path Indicator |
| PASO | Pacific Aviation Safety Organisation |
| PICs | Pacific Island Countries |
| RTA | Royal Tongan Airlines |
| SUV | Suva, Fiji |
| SYD | Sydney, Australia |
| TAL | Tonga Airports Limited |
| TBU | Tongatapu, Tonga |
| TOP | Tongan Paanga (1 TOP=US.50cents) |
| TTSCP | Tonga Transport Sector Consolidation Project |
| UNWTO | <i>United Nations World Tourism Organization</i> |
| VA | Virgin Australia |
| VAV | Vava'u, Tonga |
| VFR | Visiting Friends and Relatives |
| VOR | VHF omnidirectional range |
| WB | World Bank |

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