

# **Humpback Whales in Tonga: An Economic Resource for Tourism**

By  
*MARK B. ORAMS*

*Working paper series 2001-1*

Paper is submitted to The Coastal Management Journal and is under review

## **Humpback Whales in Tonga: An Economic Resource for Tourism**

MARK B. ORAMS

Centre for Tourism Research

Massey University at Albany

Private Bag 102 904

North Shore MSC

New Zealand

## **Humpback Whales in Tonga: An Economic Resource for Tourism**

### **Abstract**

The growth of whale-watching internationally has been spectacular. It now occurs in almost 100 countries and is estimated to be worth in excess of US\$1 billion each year in revenue. Thus, whales have become valuable as a resource for tourism. The Vava'u island group in the northern part of the Kingdom of Tonga in the South Pacific is an area with a growing reputation as a whale-watching destination. However, the industry is relatively new there and the impacts of whale based tourism in these islands is, as yet, unknown. In addition, there has been a recent consideration of a return to hunting whales in Tonga. As a result, concerns regarding the value of these animals for tourism and the potential impact of a return to hunting have arisen.

Consequently, a study was designed to provide a preliminary assessment of the economic impacts of these animals for the island community. This study revealed that humpback whales are worth in excess of T\$1 million (\$US700,000) annually and that there is significant potential for future growth. Furthermore, the study shows that current visitors are opposed to any resumption of whaling practices in the islands and that such a move would likely displace large numbers of tourists from Tonga. Thus, it is concluded, that a resumption of whaling in Tonga would likely have a significant opportunity cost in terms of lost tourism revenues.

**Keywords**    tourism, whale-watching, economic impacts, Tonga, Vava'u

## **Introduction**

Whales have a history of interaction with humans that goes back far beyond Herman Melville's story of Moby Dick. They have been a source of fascination for peoples from coastal communities throughout the world over the ages. Their images are found in paintings, on coins and in early writings from as long ago as the first century (Lockyer, 1990). Over the past three hundred years, human's involvement with large cetaceans has primarily been a commercial one based upon their value as a source of products for human use (Samuels and Tyack, 2000).

Without doubt, this period of "lethal use" of whales has had the most significant impact on their numbers and almost every large whale species was hunted resulting in a severe depletion in their numbers, some species were reduced to the verge of extinction by the middle of the 20<sup>th</sup> century (Bowen and Siniff, 1999). As a result of these unsustainable hunting practices and, perhaps, as a result of a growing compassion and empathy for these animals, whales have become icons for the environmental movement. Currently, there are significant debates at cultural, political and scientific levels regarding the future management of whales (Aron et al, 1999). These debates have, to a certain degree, become polarised. On one side are those who argue that whales should be protected from any consumptive (lethal) use, on the other are those who argue that whales should be hunted on a sustainable basis.

The international agency charged with management of large whales is the International Whaling Commission (IWC). Established in 1946 by the International Convention for the Regulation of Whaling, the IWC was charged with providing for the "conservation, development, and optimum utilization of whale resources" (Article V of the Convention). While the role of the IWC was clearly intended to be pro-whaling - in more recent times it has become a "battleground" for pro-whaling and anti-whaling factions - so much so that some are becoming extremely critical of the functioning of the IWC (for example, see Aron et al, 1999). An additional issue has further complicated the controversy. In recent decades a further "value" for these animals has arisen - they have become popular as a tourism attraction. This growing industry is dependent on large numbers of whales easily accessible for observation and has placed an economic value on whales alive (Hoyt, 2000). This value has, in some instances, been utilised as an argument against the lethal use of whales as a consumable product (International Fund for Animal Welfare, 1998).

### *The Growth of Whale-Watching*

The rapid world-wide growth of whale-watching as a tourism activity over the past decade has been widely reported in the literature. Whale-watching now takes place in every continent and from countries as diverse as Argentina, South Africa, Japan, Norway, New Zealand and Tonga. Hoyt (2000) estimated that the worldwide economic impact derived from whale-watching activities in 1998 totaled more than US\$1 billion. Hoyt's review of the industry worldwide illustrates its spectacular growth. He claims that in 1983 whale-watching occurred in only 12 countries, by 1995 it had expanded to 295 communities and 65 countries and that in 1998 almost 100 countries or territories and nearly 500 communities were involved in whale-watching. There is widespread optimism about the future potential of this industry predictions are that whale-watching will continue this rapid growth rate (Hoyt, 2000).

### *Research on Whale-Watching*

Internationally, research effort directed at understanding whale-watching has focussed almost entirely on the behaviour of the whales as a result of the close approach of boats and aircraft (Constantine, 1999). Related work has focussed on the impact of noise on cetaceans (Reeves, 1992; Norris, 1994; Richardson et al, 1995).

Despite the increasing amount of work directed at understanding the impacts of whale-watching on whales, little effort has been directed at the impact of whale-watching on the watchers themselves. In addition, work assessing the impacts of the industry on host communities has been limited. This is surprising because it is obvious that whale-watching has become a significant industry world wide with important social and economic impacts.

There have, however, been a number of notable studies that give some indication of the economic impact of whales as a tourism attraction. Duffus (1988) reported the results of a study on the economic impact of whale-watching on the Vancouver Island (British Columbia, Canada) community in 1986. He found that whale-watchers spent an average of CAN\$370 per trip. Expenditure of whale tourists included \$117 on travel, \$59 on accommodation, \$50 on the whale-watch itself and \$39 on other items such as souvenirs, camera film and so on. A further

study of the same area by Duffus and Dearden (1990) found that the numbers of whale-watchers had grown to around 10,000 annually and that the average per person spend had also increased to CAN\$400. Thus whale-watching had an estimated CAN\$4 million input into the Vancouver Island economy.

Forestell and Kaufman (1996) estimated in 1990 that in Hawaii whale-watching fares alone were worth in excess of US\$3.9 million. The overall expenditure of whale related tourists in Hawaii is, of course, significantly higher because these "whale tourists" also spend money on accommodation, transportation, food, souvenirs and other attractions in the area. Work conducted by Lincoln University has also identified the significant economic impacts of whales as a tourism attraction in the New Zealand town of Kaikoura (Horn et al, 1998).

It is clear, therefore, that the value of whales alive as a tourism resource has become an important issue in discussions regarding future utilization of these animals. This is certainly the case with regard to the Kingdom of Tonga in the South Pacific where a push to resume whale hunting has been argued against by those who consider the whales of greater value alive as a tourism attraction.

### *The Kingdom of Tonga and Whales*

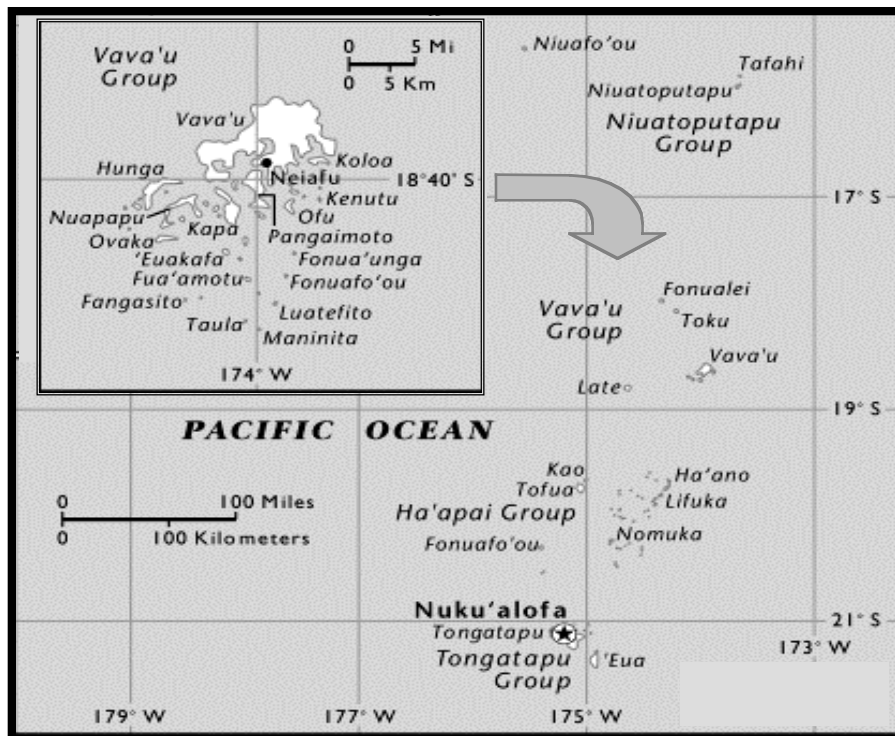
The sheltered, warm waters of the Vava'u island group in the Kingdom of Tonga (figure 1) have been an important breeding ground for humpback whales (*Megaptera novaeangliae*) for centuries. It seems likely that these islands are an important breeding area for the population of humpbacks that once migrated close to the shores of New Zealand (Baker et al, 1998). This group of humpbacks sustained a significant whaling industry in New Zealand, which between 1911 and 1963 killed over 3,600 humpbacks. Many thousands more were killed on the Antarctic feeding grounds, including 48,000 illegally taken by the former Soviet Union in the 1950s and 1960s (Donoghue, 2000). By 1964 numbers of the New Zealand/Tonga humpbacks had been reduced from an estimated 10,000 to less than 250 whales (Donoghue, 2000). This "collapse" of the population reflected a worldwide trend in humpback numbers as a result of whaling activities. Despite dwindling numbers, whaling practices continued on a small scale in Tonga until 1978 when the King of Tonga imposed a prohibition on whaling. The protection provided

by that decision probably saved the humpbacks from complete extinction in Tongan waters. However, despite two decades of protection the numbers of whales breeding in Tonga are still extremely low and concern remains over the survival of this group. In contrast to the humpbacks that migrate up the east and west coast of Australia, where a steady recovery in numbers is occurring (Queensland Department of Environment and Heritage, 1993), there is no evidence of a similar recovery in the New Zealand/Tonga group.

The South Pacific Humpback Whale Project, a group of scientists examining population and genetic issues in the Tongan humpbacks, have been conducting field studies in Vava'u since 1993. Broad population estimates from this research show that the Tongan humpback population, an unknown proportion of which visits Vava'u, may number around 500, but could be as low as 300 or as high as 700 (Baker et al, 1998). The Tongan humpback population is therefore endangered and is a small fraction of the original numbers.

In the past five years a small scale whale-watching industry has developed in Vava'u. This industry has received considerable attention and appears to have significant potential given the worldwide growth of whale-watching and the recognition of the opportunities which exist in the Vava'u island group.

Figure 1: The Vava'u Island Group in the



## **Study Objectives**

It is clear that humpback whales are an important and growing tourism resource for Tonga, and particularly for Vava'u. They are heavily utilized in promotional material for the islands and local operators report a growing number of "whale-tourists" visiting the area. The tourism industry, while small, is an important one for Vava'u. The community in the Vava'u area is a small one, with only around 16,000 people. In addition, its economy is fragile; it has significantly less agricultural production and virtually none of the manufacturing, forestry and service industries of the larger island of Tongatapu to the south. As a result, tourism is an economic activity that is extremely important in Vava'u. Furthermore, the potential for growth in tourism to the area has long been recognized. One of the greatest potential contributors to that growth is whale-watching. Whale-watching's spectacular growth world wide over the past decade reveals the high demand for the activity. The natural marine environment of Vava'u and the presence of humpbacks has resulted in the establishment of five whale-watching businesses in the area. There is, however, no specific information regarding the state of the whale-watching industry in Vava'u. This information would be useful in quantifying the economic influence of the whales as a tourism attraction and identifying future management strategies for the industry.

In addition, consideration is being given in Tonga of a return to whaling activities. Despite the royal decree protecting whales in Tongan waters, a female humpback whale was butchered near the capital Nuku'olofa and the meat distributed for local consumption in July 1999. Thus, an important issue for Tonga is the potential future utilization of whales. Questions regarding the value of these whales alive as a tourism attraction have arisen and concerns exist about the potential impact on tourism that could result from a return to whaling in the Kingdom.

As a consequence a study was developed to examine the impact of whale-watching on the Vava'u community. In particular, the economic influence of the whales' as a tourism resource was tested and additional information on tourists' characteristics, behavior and attitudes was obtained. Specifically the following objectives formed the basis for this research.

- 1. To estimate the economic impacts of the whale-watching industry to the Vava'u community.**
- 2. To consider those impacts in the context of the historical growth of tourism in Vava'u and whale-watching elsewhere.**
- 3. To estimate the future economic potential of the whales as a tourism attraction in the area.**
- 4. To consider the potential impacts on tourism of a resumption of whaling in Tonga.**

## **Background**

### *Tourism in Tonga*

Tonga is a relatively small nation with a modest economy. GDP for Tonga was estimated at T\$231 million in 1996/97 (Tourism Council of the South Pacific, 1997). The 1996 census in the Kingdom reported a population of 97,446. The great majority of these people (68%) reside on the island of Tongatapu. The Vava'u island group has around 16% of the nation's people with a population of around 16,000. Tongan society is characterized by several important features. First, it is a constitutional monarchy. King Taufa'ahau Tupou IV is the current head of state in Tonga. He represents a long history of ruling monarchs who can be traced as far back as the tenth century. Political rule in Tonga is conducted through a Legislative Assembly which consists of nine democratically elected "people's representatives", however, a majority is always held by royally appointed representatives and "nobles" - members of the extended royal family. Second, Tonga is an intensely religious society. Christianity is enshrined in the laws and constitution of Tonga - the most obvious outward expression of this is the prohibition of commercial activities, work and organized sport on Sundays. Third, the influence of the large number of Tongans who live outside Tonga (approximately 60,000) is important economically and socially. In particular the sending home of income from family members working overseas - payments that are termed "remittances" - form an extremely important source of income for Tonga.

In addition to remittances, agricultural production of produce such as pineapples, papayas, kava, taro, bananas, yams, coconuts and especially of late, pumpkins and squash are an important source of food for locals and income as some of these crops are exported. Fishing and forestry

also contribute to the economy. It is, however, tourism that is often referred to as the "economic star on the horizon" for Tonga (Keller and Swaney, 1997).

Currently it is estimated that tourism brings in around T\$12.3 million (1997/98) in foreign exchange earnings. Total international visitor arrivals for 1998 were 29,281 (Tonga Visitors Bureau, unpublished data). The great majority of visitors to Tonga come by aircraft (80%) and land at Fua'amotu International Airport on Tongatapu, however, cruise ship passengers (10%) and cruising yachts (10%) also contribute significantly to visitor arrivals (table 2). It is however, important to note that over half of the aircraft arrivals are expatriate Tongans returning to the islands to visit friends and relatives. Only 45% of visitors who arrive by air classify themselves as on holiday and it is thought that a number of these may also be overseas based Tongans visiting "home" (Tourism Council of the South Pacific, 1997). Thus, the actual number of vacationing tourists visiting Tonga is actually quite small, probably around 16,000 in 1998.

Tourism has, however, been identified as an important potential growth area for Tonga.

Government policy is to further support and promote tourism as a major earner of foreign exchange and to play an expanded role in sustainable economic development (Tourism Council of the South Pacific, 1997).

The Tonga Visitors Bureau and the Tongan Government has made significant investment in recent years to support the development of tourism in the Kingdom through promotional campaigns, the establishment of Royal Tongan Airlines, the extension of airport runways and the upgrading of airport facilities.

#### *Tourism in Vava'u*

The Vava'u island group consists of around 50 small islands surrounding Vava'u island, the largest of the group. It is located in the northern part of the Kingdom of Tonga lying 160 miles north of Tongatapu (figure 1). The main town in Vava'u is Neiafu located on the shores of the Port of Refuge harbor. A large number of small villages on both Vava'u and other islands exist, however, many islands are uninhabited.

Vava'u has, for many decades, been an important stop-over for cruising yachts making their way through the South Pacific. Particularly those coming and going from the Panama canal to New Zealand and Australia via the South Pacific islands. More recently Vava'u has also become well known as a specific tourist destination for visitors who travel via aircraft. Unfortunately specific data on tourism numbers are not available for Vava'u. However, in 1997 Vava'u received 7,266 air arrivals, 345 cruise ship passengers and 844 yacht based visitors (Tonga Visitors Bureau, unpublished data). It is reasonable to assume that the proportion of air arrivals who were actually vacationers (as opposed to visiting friends and relatives) would be greater than that for Tongatapu as Vava'u is more well known as a "tourist destination" and its local population is small. Thus an estimate of 60% of visitors who traveled by aircraft as vacationers is reasonable. Consequently, a total of 4,460 aircraft based vacationers are estimated for Vava'u in 1997. Conversely, the numbers of yacht based visitors is likely to be an underestimate as the official figures report only those yachts who actually check in with customs in Vava'u. Many yachts, particularly those travelling north from New Zealand and Australia check in at Nuku'alofa and possibly a small number in the Ha'apai island group. It also seems likely that some yachts that spend only a few days in the Vava'u area may not bother to check in with customs. Thus, it is reasonable that the figures for yacht based visitors to Vava'u may underestimate actual visitation by around 25%. Consequently, the estimate of yacht based visitors to the area in 1997 is adjusted upwards to 1,055. The total number of vacationers to Vava'u in 1997 is therefore estimated to be 5,860 (table 1).

|                          | Actual 1997<br>(TVB Figures) | Adjustment  | Estimated number of<br>vacationers |
|--------------------------|------------------------------|---|------------------------------------|
| Visitors via aircraft    | 7,266                        | 60% holiday<br>40% VFR, business and<br>other reasons | 4,460<br>(75%)                     |
| Visitors via yacht       | 844                          | +25% who cleared<br>customs elsewhere                 | 1055<br>(20%)                      |
| Visitors via cruise ship | 345                          | -   | 345<br>(5%)                        |
| TOTAL                    | 8,455                        |   | 5,860                              |

An important issue with regard to tourism in Vava'u (and Tonga as a whole) is that the visitation is highly seasonal. In Vava'u in particular, the June to October period is the peak. Almost all yacht based visitors are confined to this period (table 2). Vacationers who come via aircraft are more evenly distributed throughout the year, however peaks also occur over the June to October period (table 3).

| Month     | 1994   |          | 1995   |          | 1996   |          | 1997   |          | 1998   |          |
|-----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|
|           | Yachts | Visitors | Yachts | Visitors | Yachts | Visitors | Yachts | Visitors | Yachts | Visitors |
| January   | 0      | 0        | 0      | 0        | 2      | 7        | 0      | 0        | 4      | 14       |
| February  | 1      | 1        | 2      | 11       | 3      | 17       | 1      | 3        | 2      | 11       |
| March     | 0      | 0        | 1      | 4        | 2      | 5        | 0      | 0        | 1      | 2        |
| April     | 7      | 25       | 1      | 4        | 2      | 5        | 0      | 0        | 1      | 2        |
| May       | 56     | 189      | 38     | 160      | 38     | 123      | 24     | 58       | 16     | 68       |
| June      | 110    | 323      | 66     | 232      | 87     | 317      | 24     | 66       | 52     | 264      |
| July      | 84     | 264      | 76     | 198      | 72     | 214      | 35     | 112      | 52     | 167      |
| August    | 93     | 297      | 82     | 222      | 58     | 162      | 61     | 181      | 98     | 265      |
| September | 72     | 186      | 86     | 226      | 74     | 198      | 79     | 205      | 70     | 201      |
| October   | 71     | 174      | 66     | 185      | 71     | 210      | 50     | 179      | 53     | 144      |
| November  | 12     | 31       | 10     | 30       | 8      | 26       | 4      | 10       | 8      | 25       |
| December  | 4      | 17       | 4      | 18       | 7      | 16       | 3      | 7        | 1      | 2        |
| TOTAL     | 510    | 1507     | 432    | 1290     | 429    | 1320     | 288    | 844      | 362    | 1183     |

**Table 3: Estimated Number of Vacationers to Vava'u arriving by aircraft 1995-1998**

(Source: Estimates derived Tonga Visitors Bureau data and from interviews with Vava'u tourism operators)

| Month     | 1995     |     | 1996     |     | 1997     |     | 1998     |     | 1999     |   |
|-----------|----------|-----|----------|-----|----------|-----|----------|-----|----------|---|
|           | Visitors | %   | Visitors | %   | Visitors | %   | Visitors | %   | Visitors | % |
| January   | 280      | 5   | 260      | 4   | 290      | 7   | 220      | 5   | 300      |   |
| February  | 270      | 5   | 190      | 3   | 180      | 4   | 240      | 6   | 320      |   |
| March     | 230      | 5   | 270      | 5   | 175      | 4   | 230      | 6   | 320      |   |
| April     | 260      | 5   | 200      | 3   | 230      | 5   | 210      | 5   | 370      |   |
| May       | 490      | 9   | 390      | 7   | 460      | 10  | 290      | 7   | 420      |   |
| June      | 520      | 9   | 600      | 11  | 520      | 12  | 340      | 8   | 470      |   |
| July      | 740      | 13  | 800      | 14  | 525      | 12  | 340      | 8   | 520      |   |
| August    | 900      | 16  | 960      | 17  | 680      | 15  | 810      | 19  | 990      |   |
| September | 750      | 14  | 640      | 11  | 620      | 14  | 630      | 15  |          |   |
| October   | 620      | 11  | 780      | 14  | 370      | 8   | 560      | 13  |          |   |
| November  | 300      | 5   | 390      | 7   | 210      | 5   | 180      | 4   |          |   |
| December  | 180      | 3   | 220      | 4   | 180      | 4   | 170      | 4   |          |   |
| TOTAL     | 5,540    | 100 | 5,700    | 100 | 4,460    | 100 | 4,220    | 100 |          |   |

The estimates shown in table 3 are consistent with the impressions of tourist business operators in the Vava'u area who stated that tourism numbers had been slowly declining in the area since 1995, but that the first half of 1999 had shown a marked "up-swing" in visitor numbers.

There are currently 53 officially licensed tourism operators in the Vava'u area (table 4). A number of these operators offer more than one service (for example, accommodation, restaurant and bar). In addition, there are many operators who could only be classified as part time. In fact, around half of the operators with licenses maintain extremely small operations which run on an "on demand" basis. Thus, the tourism infrastructure is modest in Vava'u. Other operations significantly supported by tourism are the Royal Tongan Airlines staff who maintain an office in Neiafu and at the airport, local taxi drivers - all of whom utilize their own vehicles on an "on demand" basis. Approximately 50 vehicles are registered as being able to be used as taxis in Vava'u. Additionally, the Tonga Visitors Bureau maintains an office in Neiafu.

| Table 4: Licensed Tourism Operations in Vava'u 1999<br>(Source: Tonga Visitors Bureau unpublished data) |        |
|---|--------|
| Type of Operation   | Number |
| Resort/Hotel  | 8      |
| Guest House/Motel/Lodge   | 12     |
| Restaurant/Bar/Cafe   | 8      |
| Craft/Souvenir  | 6      |
| Charter Yacht   | 5      |
| Charter Fishing   | 5      |
| Other Charter Boat  | 1      |
| Whale-watch   | 5      |
| SCUBA Diving  | 2      |
| Tours   | 3      |
| Kayak   | 1      |
| Feast/Cultural Performance  | 3      |

Vava'u has been identified by many as the destination with the greatest potential for tourism in Tonga. For example, the Tourism Council of the South Pacific (1997) claim that "Vava'u is a world class attraction able to be promoted as a 'must see'". The natural attractions of Vava'u and indeed Tonga as a whole are those of a marine nature; coral reefs, islands, beaches and wildlife; fish, birds, whales and dolphins. Other important attractions are the climate, the geographical location for yachts cruising the South Pacific (and safe anchorages and relatively easy navigation), the local people and culture. The tourism industry in Tonga and especially in Vava'u is, therefore, primarily a location where vacationers visit for nature based marine attractions and activities. The Tonga Visitors Bureau and the tourism industry recognize this and utilize images associated with these attractions to promote the area.

## Methods

### *Estimating the Economic Impacts of Whale-watching*

The prime objective of this study is to "estimate the economic impacts of the whale-watching industry to the Vava'u community". Consequently, this study differs from an assessment of the "economic value" of whale-watching. This is an important distinction because a calculation of economic value would include a consideration of costs and, additionally it would include an estimate of consumer and producer surplus and the "non-use" value of the resource. Resources have value to people that go beyond their current "use". For example, many people place value on the simple "existence" of a resource (Freeman, 1993). This concept is quite important with regard to natural, cultural and historical resources. For instance, many people value the existence of the Egyptian Pyramids irrespective of whether they have "used" them as a tourism attraction or not. Values such as these are termed "non-use values". Further non-use values include "option values" - the value one places on the future ability to use a resource and "bequest values" - the value one places on the ability of future generations or others in current generations to use a resource (Randall, 1991). The whales that visit Tongan waters have, therefore, value independent of and in addition to the income they generate as a tourism resource (or as a source of food). This study, however, does not measure those values, it simply provides an assessment of the amount of additional expenditure that the whale watching industry brings into the Vava'u community and considers the additional "downstream" impacts of that expenditure. Alternatively, this study can be said to estimate the expenditure that would be lost if whale watching no longer occurred in the area.

Economists recognize that the economic impacts of a particular industry extend beyond the expenditure of customers on products and services produced by that industry (Leeworthy and Vanasse, 1999). The initial spending of tourists (in this case) supports businesses. These businesses "re-spend" this money on employees, goods and services and so on - the costs of production for their business (some is retained as profit and investment). These employees and other businesses also "re-spend" this additional money. This "ripple effect" is termed the "multiplier". The calculation of multipliers for specific resources and in specific communities has

been somewhat controversial because it is not an exact calculation (Hvenegaard, 1997). It does, however, provide an indication of the economic impact of a particular industry.

The total economic impact of additional expenditure in a community is viewed as the sum of the direct, indirect and induced effects. Direct effects are the initial spending of tourists on the goods and services associated with whale watching (in this case). The indirect effects are the expenditure of whale watching businesses on goods and services they need to operate. The induced effects are related to the businesses and employees that receive additional income as a result of the direct and indirect expenditure. The total economic impact of a particular industry therefore, is the sum of the direct, indirect and induced expenditure on that industry (Leeworthy and Vanasse, 1999).

While this study is limited to an evaluation of the economic impacts of whales as a tourism resource in Vava'u it is important to acknowledge that there may be a number of "costs" associated with whale-watching. While "production" of the whales themselves is not a cost, whale-watching businesses sustain "production costs" such as the cost of boats, fuel, safety equipment, marketing material and staff.

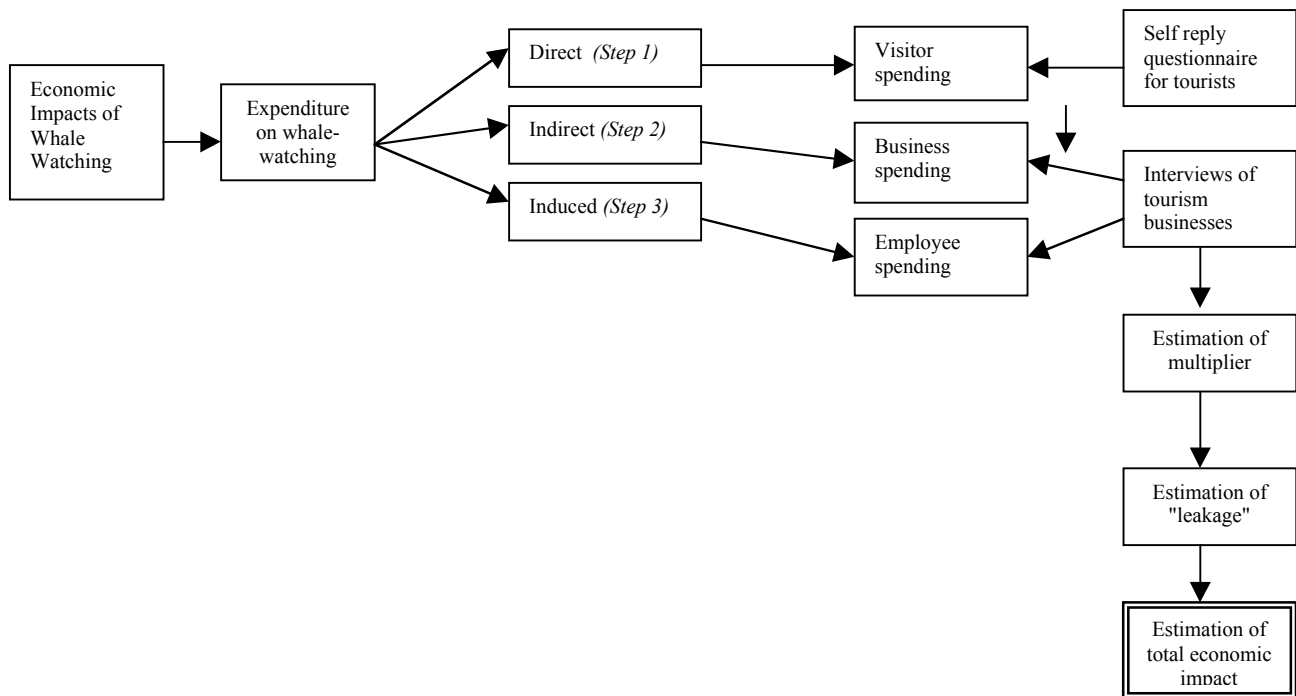
Further potential costs are those caused as an outcome of the operation of the business. It is widely understood that tourism businesses can have significant negative impacts - "costs" - for host communities and environments (Orams, 1999). However, a 1997 study commissioned by the Tourism Council of the South Pacific claimed that negative forces associated with tourism "are avoided in Tonga because of the strong community, religious and cultural beliefs" (Tourism Council of the South Pacific, 1997, 2). While this claim is not substantiated through any empirical research, it is reasonable to conclude that tourism at its current level is a strong positive economic influence for Vava'u and Tonga and that it has few costs currently. However, in the case of an assessment of the economic impacts of whale-watching there are a number of potential "costs". Examples could be potential pollution of the Vava'u environment through such things as whale-watch boat fuel spillage or litter from whale tourists, demand induced inflation in Vava'u as a result of increased tourism or a distortion of patterns of investment in the area. However, the chances of these kinds of "costs" occurring are currently small in the Vava'u

situation. The level of tourism in Vava'u is not high, the isolation of the area means that "economic leakage" is relatively low and additionally, Tongan law does not permit foreign ownership of land and it requires the involvement of local Tongans in tourism businesses (Tourism Council of the South Pacific, 1995).

*Research Instruments*

In order to allow a calculation of economic impacts a number of research instruments were needed. Each of these instruments provided information that permitted a calculation of the economic impact associated with each component of the use-value of the resource. This is reflected in figure 2.

Figure 2: Components of the Economic Impacts of Whale-watching



Note: The use of employee spending is but a small part of induced expenditure. This category is, as a consequence, an under-estimate of the true induced effect.

Two main data gathering instruments were utilized in this study. In addition, data from the Tonga Visitors Bureau were used to check the validity of the sample and to extrapolate results from the sample. The instruments designed to collect primary data were:

1. A sample of all vacationing tourists to Vava'u were given a self-reply questionnaire. Responding to these questionnaires was voluntary and they were written in English. Questionnaires used a combination of closed and open-ended questions to elicit responses on matters of expenditure, motivation, satisfaction and socio-demographic information.
2. Business operators where whales form an important attraction for clients were surveyed. A structured interview was undertaken with each of the five permitted whale-watch operators. This interview ascertained information regarding business finances, including annual turnover, wages and expenditure. Information on employee numbers, years of operation, growth rates and attitudes were also obtained. Additionally, interviews with the seven major tourism operators in the area were conducted. This was undertaken to obtain representation in the sample from businesses whose clients may have been, in part, participants in whale-watching.

### *Sample Structure and Representation*

The time available for fieldwork in Vava'u was limited for this study. As a result, a multi-instrument approach was used. First secondary data were obtained from the Tongan Visitors Bureau. These data provided information on visitor arrivals in Vava'u over the past five years. This was used to structure the sample for the fieldwork. Furthermore, this overall annual information was applied to the results of the week's fieldwork so that an extrapolation to annual figures could be made. As a consequence, it is assumed that the data gathered from the fieldwork is an accurate representation of all tourists visiting Vava'u. This assumption is fundamental, for if the sample collected during fieldwork is not representative or typical then the inferences made from this sample are invalid.

Every effort was made to ensure that the sample was representative. Self-reply questionnaires were administered to visitors waiting to board aircraft at Lupepau'u Airport. All air visitors exit

Vava'u via this airport. Additionally, self-reply questionnaires were also administered to tourists at three waterfront restaurant/cafes (Ana's, The Mermaid and The Bounty Bar) that were popular with tourists. Finally, approaches were made to yachts moored/anchored at four popular anchorages close to Neiafu. In each situation every tourist available was asked to participate in the study. A total of 51 questionnaires were completed by yacht based visitors and 85 by aircraft vacationers resulting in a total sample of 136 questionnaires. Five tourists declined to participate in the study, two were the result of language (they did not speak English) and three were refused because of time constraints (tourists in a hurry and late for the plane). One respondent self-selected and six questionnaires handed out to yacht based visitors were not returned. This refusal/non-completion rate is small and not likely to affect the validity of the sample.

Specific data on the composition of the tourist population visiting Vava'u are not available and therefore it is difficult to conduct tests regarding the validity of the sample. However, information is available for Tonga as a whole. A comparison of the country of origin for vacationers to Tonga and in the sample is provided in table 5. The distribution of the sample for Vava'u approximates the distribution for Tonga as a whole and differences observed could be explained by differences between Vava'u and other Tongan destinations. For example, it is likely that Vava'u would attract smaller numbers of vacationers from Asian countries (included in the "other" category) as this market is dominated by package tours that frequent the more developed destinations surrounding Tongatapu, rather than the more remote and less developed Vava'u area. The brief comparison shown in table 5 provides evidence that suggests the sample obtained in Vava'u is representative of the population of vacationers that visit Vava'u.

|  | Airline vacationers to Tonga 1997 | Airline vacationers in Vava'u sample | Yacht visitors to Tonga 1998 | Yacht visitors in Vava'u sample |
|--|-----------------------------------|--------------------------------------|------------------------------|---------------------------------|
| Oceania  | 36%                               | 42%                                  | 35%                          | 38%                             |
| Americas *   | 23%                               | 28%                                  | 24%                          | 29%                             |
| Europe   | 31%                               | 27%                                  | 23%                          | 16%                             |
| Other  | 10%                               | 3%                                   | 18%                          | 17%                             |
| * Yacht based visitors only includes USA in "Americas" category, Canada etc included under "Other" |                                   |                                      |                              |                                 |

An additional issue relevant to an analysis of the sample is the composition relative to access mode. Table 6 provides an overview of the proportion of vacationers who arrive in Vava'u via aircraft and via yacht for the months of July through until October. The sample closely matches this proportion and this provides further evidence that the sample provides a valid representation of the population of vacationers visiting the area during the whale-watching season.

| Table 6: Proportion of Vacationers to Vava'u arriving by Aircraft and Yacht<br>July - October |  |
|---|--|
| Vava'u<br>(1998 figures)  | Sample   |
| Via aircraft: 1534 = 60%  | Via aircraft: (n=51) = 62%                         |
| Via yacht: 1041 = 40%   | Via yacht: (n=85) = 38%                            |
| Total vacationers = 2,575   | Total sample =136<br>(sample = 5.3% of population) |

Two cruise ships visited Vava'u in 1998 with a total of 473 visitors. No cruise ships were visiting Vava'u during the fieldwork for this study and therefore this group is not represented in the sample. Despite this omission, it seems reasonable to accept the assumptions regarding the representation of the sample. While the sample is relatively small and the study was conducted over a short time frame, an analysis of the sample with the limited data available of tourists to Vava'u shows that the sample is not dissimilar from the population targeted for this study.

#### *Confidentiality and Ethical Issues*

Because this study solicited financial information that could be of a sensitive commercial nature to businesses and individuals it was important that anonymity and confidentiality was assured. An introductory letter assuring respondents of these ethical policies was attached as a cover to each questionnaire. In addition, a similar letter was handed to business interviewees and a letter of consent was signed by each before the interview commenced.

As a result of these assurances given to respondents it is not possible to report individual's nor specific businesses' information. Thus, aggregated results are all that are presented in this paper. In addition, some of the specific data utilized to arrive at economic benefit calculations such as

business annual turnover, wages and spend in the community are not presented here. The business community in Vava'u is small and, as a consequence, it is relatively easy to identify data from individual businesses even if it is presented via categories. Therefore, only overall, aggregated data is presented here to protect the confidentiality of the businesses interviewed.

## **Results and Discussion**

*Calculation of Economic Impacts* (Note: All financial data are reported in Tongan dollars - equivalent to US 70c)

The model presented earlier in (figure 2) was used as the basis for calculating the economic impacts of whale-watching in Vava'u. The self-reply questionnaire distributed to yacht based visitors and air vacationers solicited information on respondents' expenditure on whale-watching and on other aspects of the stay in Vava'u. These data were utilized to calculate an average expenditure per person per day for whale-watching across variables such as the whale-watch fare, the amount spent on food, film for cameras, specific whale related souvenirs associated with the trip and "other" items such as sea-sickness medication and sun-screen. These data were calculated separately for air vacationers and yacht based visitors and a summary is presented in table 7. Calculations are based on a conservative estimate of 1,500 air vacationers to Vava'u during the whale-watching season (July - October) 60% of whom (900) went commercial whale-watching. In addition, four per cent of 800 yacht based visitors (32) are estimated to have participated in a commercial whale-watch. A conservative estimate is also made regarding the expenditure of those who went whale-watching from private and charter yachts, only expenditure on specific whale related souvenirs and fuel (private yachts only) are included in the calculation.

The results of this calculation estimate that direct expenditure on whale-watching each season in Vava'u totals around T\$78,000, \$51,740 of which is receipts from whale-watch fares. However, it seems likely that respondents may have under-reported their expenditure on whale-watching. This is common when tourists are asked to recall expenditure that may have occurred many days earlier. Interviews with the five whale-watch operators provided estimates of expenditure on whale-watch fares alone of a minimum of T\$90,000 per season. Consequently, a range from \$78,000 (tourists own estimates) to \$116,000 (operator's estimates) is adopted as a reasonable

estimate of the direct expenditure of yacht based visitors and air vacationers to Vava'u each season.

| <b>Table 7: Direct Expenditure on Whale-watching by Visitors to Vava'u</b><br>(all figures in Tongan dollars and average per person unless otherwise specified)   |   |   |   |   |  |
|---|---|---|---|---|--|
|   | Whale-watch fare  | Food  | Film                                    | Souvenirs                                 | Other  |
| Commercial whale-watching by air vacationers  | \$55  | \$7.20  | \$5                                     | \$7.40                                    | \$2.40   |
| <b>Sub-total for season</b>   | 60 per cent of air vacationers = $0.6 \times 1500 = 900$ whale-watchers x \$55 per trip = <b>\$49,500</b> | 900 whale-watchers x 7.2 = <b>\$6,480</b>               | 900 whale-watchers x 5 = <b>\$4,500</b> | 900 whale-watchers x 7.4 = <b>\$6,660</b> | 900 whale-watchers x 2.4 = <b>\$2,160</b>            |
| Commercial whale-watching by yacht visitors   | \$70  | \$8.40  | \$9                                     | \$12                                      | 0  |
| <b>Sub-total for season</b>   | 4 per cent of yacht visitors = $0.04 \times 800 = 32$ whale-watchers x \$70 per trip = <b>\$2,240</b>     | 32 whale-watchers x 8.4 = <b>\$268.80</b>               | 32 whale-watchers x 9 = <b>\$288</b>    | 32 whale-watchers x 12 = <b>\$384</b>     | 0  |
| Whale-watching onboard private yachts   | n/a   | 0<br>(included as part of overall provisions for yacht) | 0<br>(film bought outside Vava'u)       | \$3                                       | \$10<br>(per trip on fuel)                           |
| <b>Sub-total for season</b>   | 46 per cent of yacht visitors = $0.46 \times 800 = 368$ whale-watchers                                    | 0   | 0                                       | 368 whale-watchers x \$3 = <b>\$1,104</b> | 368 whale-watchers x \$10 = <b>\$3,680</b>           |
| Whale-watching onboard charter yachts   | n/a   | 0<br>(included as part of overall provisions for yacht) | 0<br>(film bought outside Vava'u)       | \$3                                       | 0<br>(fuel included as part of overall charter cost) |
| <b>Sub-total for season</b>   | 22 per cent of air vacationers watch whales from charter yachts = $0.22 \times 1500 = 330$                | 0   | 0                                       | 330 whale-watchers x \$3 = <b>\$990</b>   | 0  |
| <b>SEASON TOTAL</b>   | <b>\$51,740</b>   | <b>\$6,748.80</b>                                       | <b>\$4,788</b>                          | <b>\$9,138</b>                            | <b>\$5,840</b>                                       |
| <b>TOTAL DIRECT EXPENDITURE ON WHALE-WATCHING PER SEASON:<br/>\$78,000 - \$116,000</b>  |   |   |   |   |  |
| <p>Assumptions: 50% of those who stated that they intended to go whale-watching actually do.<br/> Those who stated they went whale-watching only went whale-watching once during their stay in Vava'u.<br/> Notes: Results reported in this table are data taken from the visitor questionnaire.<br/> The estimate provided above is a minimum figure. Respondents tended to underestimate their spend while in Vava'u. In addition, whale-watch operators report greater numbers of clients spending a minimum of \$90,000 on whale-watch fares per season. As a result a range is reported for the total direct expenditure calculation<br/> Final total rounded to nearest thousand.</p> |   |   |   |   |  |

A similar approach to that shown in table 7 was used to estimate the expenditure of tourists who went whale-watching whilst in Vava'u (table 8). This calculation is not a representation of the economic impact of whale-watching in Vava'u as much of this expenditure may have occurred irrespective of the presence of whales and a whale-watching industry there. Nevertheless, it provides an indication of the potential opportunity cost of a loss of all tourists in Vava'u who went whale-watching. This loss could be substantial, totaling in excess of T\$2.3 million.

| <b>Table 8: Other Expenditure by Visitors to Vava'u Who Went Whale-watching</b><br>(all figures in Tongan dollars and average per person per day unless otherwise specified)  |   |  |   |   |  |
|---|---|--|---|---|--|
|   | Accommodation   | Food   | Transport   | Souvenirs   | Other  |
| Air vacationers   | \$110.32  | \$35.55  | \$3.30  | \$2.30  | \$4.97   |
| <b>Per day Sub-total</b>  | 1,230 whale-watchers x \$110.32<br>= <b>\$135,693.60</b>    | 1,230 whale-watchers x 35.55<br>= <b>\$43,726.50</b>     | 1,230 whale-watchers x 3.3<br>= <b>\$4,059</b>          | 1,230 whale-watchers x 20.3<br>= <b>\$2,829</b>         | 1,230 whale-watchers x 4.97<br>= <b>\$6,113.10</b>       |
| Multiplied by average stay in Vava'u of 9.7 days<br>= <b>Sub-total for season</b>   | <b>\$1,316,227.90</b>                                       | <b>\$424,147.05</b>                                      | <b>\$39,372.30</b>                                      | <b>\$27,441.30</b>                                      | <b>\$59,297.07</b>                                       |
| Yacht Visitors  | \$4.61  | \$23.50  | \$0.77  | \$1.16  | \$6.31<br>(mainly fuel and boat parts)                   |
| <b>Per day Sub-total</b>  | 400 whale-watchers from yachts x \$4.61<br>= <b>\$1,844</b> | 400 whale-watcher from yachts x 23.5<br>= <b>\$9,400</b> | 400 whale-watchers from yachts x 0.77<br>= <b>\$308</b> | 400 whale-watchers from yachts x 1.16<br>= <b>\$464</b> | 40 whale-watchers from yachts x 6.31<br>= <b>\$2,524</b> |
| Multiplied by average stay in Vava'u of 33 days<br>= <b>Sub-total for season</b>  | <b>\$60,852</b>   | <b>\$310,200</b>   | <b>\$10,164</b>   | <b>\$15,312</b>   | <b>\$83,292</b>  |
| <b>SEASON TOTAL</b>   | <b>\$1,377,079.90</b>                                       | <b>\$734,347.05</b>                                      | <b>\$49,536.30</b>                                      | <b>\$42,753.30</b>                                      | <b>\$142,589.07</b>                                      |
| <b>TOTAL INDIRECT EXPENDITURE IN VAVA'U BY VISITORS WHO GO WHALE-WATCHING EACH SEASON: \$2,346,306</b>  |   |  |   |   |  |
| <p>Assumptions: 50% of those who stated that they intended to go whale-watching actually do.<br/> Notes: Accommodation includes yacht charter costs.<br/> "Other" includes costs of other attractions.<br/> Food also includes beverages.<br/> Final total rounded to nearest dollar.</p> |   |  |   |   |  |

Table 9 provides an important indication of the value of whale-watching in Vava'u. Calculations are based on those "whale tourists" who specifically visit Vava'u to watch the whales. This provides important information for estimating the value of whale-watching in Vava'u because it is that expenditure which would be lost if whale-watching did not occur in the area. Those air vacationers and yacht based visitors who indicated that whales were "extremely important" in their choosing to visit Vava'u were deemed to represent this group of "hard core whale tourists". The expenditure of these whale tourists while in Vava'u (table 9) together with the actual expenditure on whale-watching (table 7) constitutes the category of "direct expenditure". This figure is T\$648,000 - T\$686,000 per season and constitutes *Step 1* of the calculation of the economic impacts of whale-watching outlined in figure 2. It can be argued that the expenditure of "whale tourists" on their travel to and from Vava'u (air-fares etc.) could also be included as part of this calculation. However, it has been decided to exclude it as the great majority of this money is spent outside Vava'u. It could also be argued that this figure is an underestimate of the potential opportunity cost of whale-watching activities in Vava'u (the amount of revenue that would be lost if whale-watching did not occur in the area). It is likely that a portion of other tourists visiting Vava'u in addition to those who visited there specifically for the whales would also be lost to the area without whale-watching as an attraction for Vava'u.

| <b>Table 9: Other Expenditure by Whale Tourists Visiting Vava'u</b><br>(all figures in Tongan dollars and average per person per day unless otherwise specified)                             |   |   |   |  |   |
|--|---|---|---|--|---|
|  | Accommodation   | Food  | Transport                                 | Souvenirs                                  | Other   |
| Air vacationers  | \$110.32  | \$35.55   | \$3.30                                    | \$2.30                                     | \$4.97  |
| <b>Per day Sub-total</b>   | 22 % of air vacationers visit Vava'u specifically for the whales = 0.22 x 1500 = 330 whale tourists \$110.32 = <b>\$36,405.60</b> | 330 whale tourists x 35.55 = <b>\$11,731.50</b> | 330 whale tourists x 3.3 = <b>\$1,089</b> | 330 whale tourists x 2.3 = <b>\$759</b>    | 330 whale tourists x 4.97 = <b>\$1,640.10</b> |
| Multiplied by average stay in Vava'u = 9.7 days<br><b>= Sub-total for season</b>   | <b>\$353,134.32</b>   | <b>\$113,795.55</b>                             | <b>\$10,563.30</b>                        | <b>\$7,362.30</b>                          | <b>\$15,908.97</b>                            |
| Yacht Visitors   | \$4.61  | \$23.50   | \$0.77                                    | \$7.16                                     | \$6.31<br>(mainly fuel and boat parts)        |
| <b>Per day Sub-total</b>   | 8% of yacht visitors go to Vava'u primarily for the whales = 0.08 x 600 = 48 whale visitors on yachts x \$4.61 = <b>\$221.28</b>  | 48 whale yachties x 23.5 = <b>\$1,128</b>       | 48 whale yachties x 0.77 = <b>\$36.96</b> | 48 whale yachties x 7.16 = <b>\$343.68</b> | 48 whale yachties x 6.31 = <b>\$302.88</b>    |
| Multiplied by average stay in Vava'u = x 33<br><b>= Sub-total for season</b>   | <b>\$7,302.24</b>   | <b>\$37,224</b>                                 | <b>\$1,219.68</b>                         | <b>\$11,341.44</b>                         | <b>\$9,995.04</b>                             |
| <b>SEASON TOTAL</b>  | <b>\$360,436.56</b>   | <b>\$151,019.55</b>                             | <b>\$11,782.98</b>                        | <b>\$18,703.74</b>                         | <b>\$25,904.01</b>                            |
| <b>TOTAL INDIRECT EXPENDITURE IN VAVA'U BY WHALE TOURISTS PER SEASON: \$567,847</b>  |   |   |   |  |   |
| Assumptions: 22% of air vacationers visit Vava'u primarily to watch whales.<br>8% of yacht visitors visit Vava'u primarily to watch whales.<br>Notes: Final total rounded to nearest dollar. |   |   |   |  |   |

Step 2 of the calculation of the economic value of whale-watching (figure 2) requires an estimation of the expenditure of whale-watching businesses. Interviews were conducted with each of the five permitted whale-watch operators in Vava'u and general estimates (specific information was not requested for ethical reasons) were obtained. As a result of these interviews

an overall business expenditure estimate of T\$56,160 was calculated. However, an important issue with regard to economic impacts on a local community is the amount of this expenditure that is made outside the area. This "economic leakage" was estimated by asking interviewees to estimate the percentage of each expenditure item made in the local community. As a result, an overall estimate of T\$47,120 business spend in the local community was calculated (table 10).

| Table 10: Expenditure in Vava'u by Whale-watch Businesses<br>(all figures in Tongan dollars and average per week unless otherwise specified)   |                 |              |                     |              |              |
|--|-----------------|--------------|---------------------|--------------|--------------|
|  | Wages           | Fuel         | Boat<br>Maintenance | Supplies     | Other        |
| Estimated totals for all permitted whale-watch operators   | \$2,800         | \$510        | \$100               | \$50         | \$50         |
| % spent in Vava'u  | 98%             | 10%          | 90%                 | 90%          | 30%          |
| Multiplied by % spent in Vava'u and by 16 week whale-watch season<br>= <b>Sub-total for season</b>   | <b>\$43,904</b> | <b>\$816</b> | <b>\$1440</b>       | <b>\$720</b> | <b>\$240</b> |
| <b>TOTAL SEASONAL EXPENDITURE IN VAVA'U BY WHALE-WATCH OPERATORS = \$47,120</b>  |                 |              |                     |              |              |
| <p>Notes: Totals are rounded estimates to protect confidentiality of operators.<br/>           Estimates are on conservative side and take into account weather related cancellations.<br/>           "Supplies" category includes safety equipment, ice, administration equipment (paper, printer ink etc.).<br/>           100% of fuel is purchased locally - however, this fuel is imported so the net benefit is estimated at 10%.<br/>           "Other" category includes marketing costs, postage, mooring fees.</p> |                 |              |                     |              |              |

*Step 3* in calculating the economic value of whale-watching is to estimate the expenditure "induced" in the local community due to the wages paid to employees of whale-watch businesses. This estimate was arrived at as a result of the whale-watch business interviews, an overall estimate of the wage bill for each business and an estimate of proportion of the expenditure of those wages in the local community totaled \$43,904 per season (table 10). The total of each of these estimates - the direct expenditure on whale-watching, the other expenditure

of "whale tourists", the local expenditure of whale-watch businesses and the local expenditure of whale-watch business employees is the estimate of the "use value" of whale-watching in Vava'u (table 11). Rounded to the nearest thousand this is T\$739,000 - T\$777,000 per season.

| Table 11: Calculation of Economic Benefit of Whale-watching in Vava'u<br>(all figures in Tongan dollars per season) |  |                                     |   |  |                       |
|---|--|-------------------------------------|---|--|-----------------------|
|   | Direct Expenditure of Visitors on Whale-watching | Other Expenditure of Whale Tourists | Whale-watch Operators Expenditure in Vava'u | Whale-watch Business Employees Expenditure in Vava'u | TOTAL                 |
| Estimated totals for all permitted whale-watch operators  | \$78 - 116,000                                   | \$570,000                           | \$47,000                                    | \$44,000   | \$739,000 - \$777,000 |
| Notes: Totals are rounded to nearest thousand.  |  |                                     |   |  |                       |

Whales are, therefore, worth around T\$750,000 in revenue to the Vava'u community each year. This economic impact is significant for a small economy. The annual foreign exchange earnings of Vava'u from tourism were estimated to be T\$2.5 million in 1997. While this figure is likely to be an underestimate, it does place the economic value of whale-watching in Vava'u in context.

This calculation of the economic benefit of whale-watching in Vava'u only takes into account the first (expenditure of whale tourists) and second round (expenditure of whale-watch businesses and their employees) of spending of whale-watching related income. It does not incorporate the spending of other businesses supported by whale tourists (for example, accommodation providers, restaurants, transportation businesses and their employees), nor does it account for the subsequent rounds of re-spending of whale-watch related income. Thus, the true multiplier effect of whale tourists' expenditure is not calculated. Consequently, the calculation of whale-watch revenue of T\$750,000 is an underestimate of the total economic benefit of whale-watching to the Vava'u community. The total economic benefit of whale-watching in Vava'u would exceed T\$1,000,000 each year.

### *Other Impacts*

It is important to recognize that there are a number of other impacts which accrue to Vava'u and to Tonga as a result of the presence of whales and the existence of a whale-watching industry there. While these have not been included in the above calculation of economic impacts there is no doubt that these other impacts do have economic as well as other less tangible impacts for the area.

Vava'u is becoming a favorite location for professional wildlife photographers, particularly those specializing in whale photography. These people not only contribute to the local economy through the hire of boats, payment for accommodation, food and supplies but also they provide significant exposure for Vava'u as a tourism destination. Similarly, television and film crews frequent Vava'u, also attracted by the spectacular scenery, the clear water and the ability to capture spectacular images of humpback whales and their calves. Film crews from Television New Zealand, TV3 (New Zealand), National Geographic (USA), The Discovery Channel (USA), the British Broadcasting Corporation, Japanese and French crews and others have visited Vava'u in the past three years. Magazine articles on the Vava'u humpback whales have also appeared recently. New Zealand Geographic, New Zealand Dive Log, Pacific Wave (Air New Zealand inflight magazine) and Lulu'tai (Royal Tongan Airlines inflight magazine) have all contained feature articles in the past three years.

Advertising in the international community for a small nation such as Tonga is a challenge. It is extremely expensive and difficult to access potential markets for tourism to Tonga. The work of these photographers, the television documentaries and magazine articles provide significant and free exposure for Vava'u and its attractions in a variety of important markets. It is the whales that are the attraction for this publicity and, therefore, they have significant economic value for Vava'u. For example, the 29 page article in New Zealand Geographic (No. 30, 1996) provided free exposure for Vava'u and Tonga. Purchasing the equivalent space for advertising in this publication would cost T\$150,000.

A further issue that should be considered is the contribution that the protection of whales in Tongan waters provides for the international image of Tonga. Tonga utilizes its image as a

religious, peaceful, friendly Kingdom as means of promoting itself internationally. Tongans themselves draw much of their self-image and sense of pride in their country and their culture from these characteristics. It is also an image attractive to the dominant tourism markets for Tonga - Australia, New Zealand, Western Europe and North America. Protection of whales and an enlightened approach to the promotion and management of a whale-watching industry is an important contribution to this international image of Tonga.

### *Attitudes Toward Whaling*

A series of attitudinal statements regarding whaling were presented to respondents in the questionnaire and their level of agreement/disagreement solicited. The results are heavily skewed indicating a high level of consistency across respondents. Both yacht based visitors (83%) and aircraft vacationers (95%) are opposed or strongly opposed to the commercial hunting of whales. Respondents were also asked to consider whether the hunting of whales in Vava'u would influence their willingness to visit Vava'u. This also revealed a strong level of consistency across respondents with 65% of yacht based visitors and 73% of aircraft borne vacationers agreeing that they would be less likely to visit Vava'u if whales were hunted there.

These attitudinal tests show, not surprisingly, that the great majority of visitors to Vava'u are opposed to any consumptive use of whales. This is important, because it reveals that any change in the protected status of whales and resumption of whaling practices, even on a small scale, might displace a large proportion of the current visitors to Vava'u. Thus, there is an opportunity cost with regard to use of the whales in Vava'u. It appears unlikely that a whale watching industry could co-exist with any lethal use of whales in Vava'u.

### **Conclusions**

Tourism is an important industry for the Kingdom of Tonga. It has been clearly identified by the Tongan government, and by previous research, that tourism has significant potential in contributing to an improved future for the Tongan people. It is obvious that whale-watching is already an important industry for Vava'u. However, in the context of the global growth of the industry, Vava'u appears to be in its "infancy" as a whale-watching destination. It could

experience significant growth over the coming decade. The demand for high quality natural experiences, particularly those based on large "charismatic" animals like whales appear to be limitless (Shackley, 1996). Vava'u is well placed to cater to this demand. It is a location blessed by a tropical climate, it has clear, clean water, it already has an established market in areas where "ecotourism" experiences are popular (North America, Western Europe, Australia and New Zealand) and it is fortunate to host one of the whale species most popular for tourism. The competitive advantage that the humpback whales give Vava'u is significant. Tonga's main competitors for tourism are other South Pacific islands, such as Fiji, Samoa, Rarotonga and Norfolk. Each of these alternates possess similar qualities to Tonga - warm climates, high quality marine environments and friendly Polynesian cultures - what Tonga has, which they do not, are humpback whales easily accessible for tourism. This is a major attraction for visitors to Vava'u and to Tonga. This competitive advantage is well recognized and utilized in promotional campaigns for Tonga - over 80 % of all written publicity material on Tonga mentions whales. Studies conducted on the tourism industry in Tonga refer to the importance of whales as a tourism attraction for the area. For example, the Kingdom of Tonga Tourism Sector Review completed in 1995 by the Tourism Council of the South Pacific identifies whale-watching as an area with significant potential for Tonga. So while this study estimates that whale-watching in Vava'u is currently worth around T\$1 million each year, it has the potential to be worth significantly more. Other small and remote locations have whale-watching industries estimated to be worth many millions annually (Hoyt, 2000). The economic contribution of the whale-watching industry to Vava'u and to Tonga could become even more important in the future.

It is important to recognize that while the demand for whale-watching opportunities is high internationally, that demand does not automatically translate into ever increasing numbers of whale tourists to Vava'u. Tourism development is constrained by many other factors, particularly in remote locations such as Vava'u. Transportation, accommodation and other elements of the tourism infrastructure in an area have a great influence on tourism numbers. Many tourism business operators in Vava'u consider these aspects to be the most important issues with regard to the future of tourism in the area. In particular, difficulties with convenient and reliable airline connections was mentioned a number of times.

Experiences at other remote tourism destinations have shown that tourism destination choice is very fickle. Changes beyond the control of the tourism industry can have a major detrimental impact on tourism arrival numbers. For example, the political unrest in Fiji as a result of the military coup in 1987 devastated the tourism industry in the area virtually overnight (Waters, 1990). Tourists who travel large distances for holidays have a wide variety of alternate destinations and, as a result, they change their choice of holiday destination very quickly if there is any perceived risk or problem in the area - or even in neighboring areas. This is an important point, because it indicates that what happens elsewhere in Tonga, and indeed in other South Pacific Islands, will influence tourism arrivals in Vava'u.

Many respondents, both visitors and business operators, felt that the way in which the whale-watching is managed in Vava'u in the future will be important. These views are backed up by experiences elsewhere. A major challenge for the future of whale-watching in Vava'u is to minimize the negative consequences of tourism development and the difficulties in hosting large numbers of tourists. Other locations have experienced conflict between operators, resentment in the local community of increasingly large numbers of visitors, inflationary pressure in the local economy and a loss of local control over local resources. These problems seem unlikely to occur in the short term in Vava'u as a result of the isolation of the destination and the Tongan policies of no foreign ownership of land and rules regarding Tongan involvement in tourism businesses. However, it is important that the Vava'u community and the Tongan government remain aware of the potential negative impacts of tourism development and that planning for future tourism development considers the potential costs as well as the potential impacts.

A further issue in managing the future of whale-watching in Vava'u is the active promotion of whale conservation and careful "use" of the whales. Forestell and Kaufman (1990, 401), for example, observe that controversy has resulted from the rapid growth of whale-watching in Hawaiian waters. They state that:

Concern has grown in every quarter that the cumulative effect of this activity may threaten the recovery and survival of this endangered species.

The humpbacks that visit Vava'u are an endangered remnant population that visit the area for mating, birthing and raising young calves. As a result, the potential for harassment of these whales is high. This is complicated by the promoted practice of swimming with the whales in Vava'u. This opportunity is one which is highly valued by whale tourists to the area, however, there is widespread agreement in the scientific community that the potential for harassment of the whales, particularly mother and calf pairs, is high. This issue of sensitivity to potential negative impacts is important because whale-watchers themselves consider it important. If Vava'u were to develop a reputation as a destination where unethical whale-watching practices were commonplace, this would likely have a detrimental impact on the tourism industry there. Furthermore, the presence of increasing numbers of humpback whales, that are relaxed and healthy in Vava'u waters, is pre-requisite for the future of the industry there. It is, therefore, imperative that the careful approach currently being promoted in Vava'u (there is a code of practice for whale-watching operators) is further developed and adhered to by all involved in the industry.

Research elsewhere has shown that the kinds of tourists attracted to whale-watching are not only motivated to view the whales but are also extremely interested in learning about whales and the marine environment (Tilt, 1987; Forestell and Kaufman, 1990; Pearce and Wilson, 1995; Neil et al, 1995; Orams, 2000). There is strong evidence that well structured education programmes add significant value to whale-watching experiences

Consumers are attracted to those experiences which offer biological, cultural, and conservation interpretation components. Consumers generally seek to participate in more interactive experiences, and the addition of a hydrophone (underwater microphone) to the onboard equipment is often regarded with great interest. Sound systems, video displays, educational resource materials are all of use to the consumer. (International Fund for Animal Welfare, 1998)

It has also been pointed out that the selling of whale and marine "souvenirs" - photographs, artwork, clothing, video and audio tapes and other such products can also "add value" to the whale-watching product (International Fund for Animal Welfare, 1998).

The lessons from other whale-watching locations around the world are valuable for Vava'u. The findings of this study are consistent with those other locations. Whale-watchers are typically well educated, are from upper socio-economic groups and are strongly conservation minded (Tilt, 1987; Forestell, 1990; Forestell and Kaufman, 1990; Pearce and Wilson, 1995; Neil et al, 1995, Orams, 2000). These tourists spend more on their holidays than most and are sensitive to environmental and ethical issues. This study has shown that whale-watchers in Vava'u are similarly inclined. This has important implications for Vava'u as a tourism destination. The great majority of current vacationers to Vava'u are attracted by the pristine marine environment, the relatively undeveloped nature of the area and the genuine natural experiences they can have there. Experiencing whales is an important component of those experiences for many. It is, therefore, important to recognize the environmentally sensitive paradigm of these visitors because it indicates that any change in the protective status of whales and resumption of whaling practices, even on a small scale, would likely displace a large proportion of the current visitors to Vava'u. Thus, there is a likely "opportunity cost" with regard to any lethal use of the whales in Vava'u. It appears unlikely that a whale-watching industry could co-exist with a lethal use of whales in Tonga.

## References

Aron, W., Burke, W. and Freeman, M. 1999. Flouting the Convention. *The Atlantic Monthly* (May). [www.theatlantic.com/issues/99may/9905whaling.htm](http://www.theatlantic.com/issues/99may/9905whaling.htm).

Baker, C.S., Florez-Gonzalez, L., Abernethy, B., Rosenbaum, H.C., Slade, R.W., Capella, J. and Bannister, J.L. (1998) Mitochondrial DNA variation and maternal gene flow among humpback whales of the Southern Hemisphere. *Marine Mammal Science* 14 (4), 721-737.

Bowen, W.B. and Siniff, D.B. 1999 Distribution, population biology and feeding ecology of marine mammals. In J.E. Reynolds and S.E. Rommel (eds), *Biology of Marine Mammals*. Smithsonian Institution Press, Washington DC and London.

Constantine, R. 1999 *Effects of Tourism on Marine Mammals in New Zealand*. Science for Conservation Series No. 106, Department of Conservation, Wellington, New Zealand.

Donoghue, M. (2000) *Whales of Oceania and the South Pacific Whale Sanctuary*. Presentation to the Humpback Whales of the South Pacific Symposium, University of Auckland, 4-6 March.

Duffus, D.A. 1988 *Non-consumptive use and management of cetaceans in British Columbia Coastal Waters*. Unpublished PhD dissertation, University of Victoria, Victoria, BC.

Duffus, D.A. and Dearden, P. 1990 Non-consumptive wildlife-oriented recreation: A conceptual framework. *Biological Conservation* 53, 213-231.

Forestell, P.H. 1990 Marine education and ocean tourism: replacing parasitism with symbiosis. In M.L. Miller and J. Auyong (eds), *Proceedings of the 1990 Congress on Coastal and Marine Tourism Vol 1*. National Coastal Resources Research Institute, Corvallis, OR.

Forestell, P.H. and Kaufman, G.D. 1990 The history of whale-watching in Hawaii and its role in enhancing visitor appreciation for endangered species. In M.L. Miller and J. Auyong (eds), *Proceedings of the 1990 Congress on Coastal and Marine Tourism Vol 1*. National Coastal Resources Research Institute, Corvallis, OR.

Forestell, P.H. and Kaufman, G.D. 1996 Whale-watching in Hawaii as a model for development of the industry worldwide. In *Encounters With Whales. 1995 Proceedings*. K. Colgan, S. Prasser and A. Jeffery (eds). Australian Nature Conservation Agency, Canberra, pp 53-65.

Freeman, A.M. 1993. *The Measurement of Environmental and Resource Values. Theory and Methods.* Resources for the Future, Washington, DC.

Horn, C., Simmons, D.G. and Fairweather, J.R. 1998 *Evolution and Change in Kaikoura: Responses to Tourism Development.* Tourism Research and Education Centre Report No. 6, Lincoln University, Canterbury, New Zealand.

Hoyt, E. 2000 *Whale-watching 2000: Worldwide Tourism Numbers, Expenditures, and Expanding Economic Impacts.* International Fund for Animal Welfare, Crowborough, UK.

Hvenegaard, G.T. 1997 The social and economic aspects of ecotourism: a review relevant to whale-watching. Paper presented at the *Socioeconomics of Whale-watching Workshop*, Kaikoura, New Zealand, December 8-12.

International Fund for Animal Welfare 1998 *Report of the Workshop on the Socioeconomic Aspects of Whale-watching.* Kaikoura, New Zealand 8-12 December 1997.

Keller, N. and Swaney, D. 1998 *Tonga.* Lonely Planet Publications, Hawthorn, Victoria, Australia.

Leeworthy, V.R. and Vanasse, P. 1999 *Economic Contribution of Recreating Visitors to the Florida Keys/Key West: Updates for Years 1996-97 and 1997-98.* Linking the Economy and Environment of the Florida Keys/Florida Bay series. National Oceanic and Atmospheric Administration, United States Department of Commerce, Monroe County Tourist Development Council and The Nature Conservancy.

[www-orca.nos.noaa.gov/projects/econkeys/econkeys.html](http://www-orca.nos.noaa.gov/projects/econkeys/econkeys.html).

Lipton, D.W., Wellman, K., Sheifer, I.C. and Weiher, R.F. 1995 *Economic Valuation of Natural Resources. A Handbook for Coastal Resource Policymakers.* NOAA Coastal Ocean Program, Decision Analysis Series No. 5. National Oceanic and Atmospheric Administration, United States Department of Commerce, Washington DC.

Lockyer, C.H. 1990 Review of incidents involving wild, sociable dolphins, worldwide. In S. Leatherwood and R.R. Reeves (eds), *The Bottlenose Dolphin*. Academic Press, San Diego.

Neil, D.T., Orams, M.B. and Baglioni, A.T. 1995 Effects of previous whale-watching experience on participants knowledge of, and response to, whales and whale-watching. In K. Colgan, S. Prasser and A. Jeffery (eds), *Encounters With Whales '95*. Australia Nature Conservation Agency, Canberra.

Norris, T. 1994 Effects of boat noise on the acoustic behaviour of humpback whales. *Journal of the Acoustic Society of America* 96(5-2), 3251.

Orams, M.B. 1999 *Marine Tourism: Development, Impacts and Management*. Routledge Publishers, London.

Orams, M.B. 2000. Getting close to whales: is it what whale-watching is all about? *Tourism Management* 21(5), 561-569.

Pearce, D.G. and Wilson, P.M. 1995 Wildlife-viewing tourists in New Zealand. *Journal of Travel Research* 34(2), 161-173.

Queensland Department of Environment and Heritage 1993 *Humpback Whales of Australia*. Queensland Department of Environment and Heritage, Brisbane.

Randall, A. 1991 Total and nonuse values. In J.B. Braden and C.D. Kolstad (eds), *Measuring the Demand for Environmental Quality*. North Holland, Amsterdam.

Reeves, R.R. 1992 *Whale Responses to Anthropogenic Sounds: A Literature Review*. Department of Conservation Science and Research Series No. 47. Department of Conservation, Wellington.

Richardson, W.J., Greene, C.R., Malme, C.I. and Thomson, D.H. 1995 *Marine Mammals and Noise*. Academic Press, San Diego, California.

Samuels, A. and Tyack, P. 2000 Flukeprints. A history of studying cetacean societies. In J. Mann, R.C. Connor, P. Tyack and H. Whitehead (eds), *Cetacean Societies. Field Studies of Dolphins and Whales*. University of Chicago Press, Chicago and London.

Tilt, W.C. 1987 From whaling to whale-watching. *Transactions of the North American Wildlife and Natural Resources Conference 52*, pp 567-585.

Tourism Council of the South Pacific. 1997 *Economic Impact Analysis of Tourism in Tonga*. Report prepared by Deloitte & Touche for the Tourism Council of the South Pacific, Suva, Fiji.

Tourism Council of the South Pacific. 1995 *Tonga Tourism Sector Review*. Report prepared by Peter Kendall, Touche Ross Management Consultants for the Tourism Council of the South Pacific, Suva, Fiji.

Waters, S.R. 1990 *Travel Industry World Yearbook: The Big Picture - 1990*. Vol. 34. Child and Waters, New York.