

# **An Economic and Social Study of the Saba Marine Park, Saba, Netherlands Antilles.**

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	<b>Page</b>
<b>Summary</b>	3
<b>1. Introduction</b>	4
1.1 The Saba Marine Park	7
<i>1.1.1 Park Zoning</i>	8
<b>2. Economic Setting</b>	9
2.1 Fishing	10
2.2 Sand	10
2.3 Tourism	11
2.4 Offshore Companies	12
2.5 Retirees and Part-time Settlers from Overseas	13
2.6 Art Work	13
2.7 Land Rentals	13
2.8 Money Transfers from other Governments and Institutions	13
<b>3. Resource Use</b>	14
3.1 Resource Use by Tourists	14
<i>3.1.1 Yachts</i>	14
<i>3.1.2 SCUBA Divers</i>	15
<i>3.1.3 Cruise Ship Tourists</i>	22
3.2 Resource Use by Locals	22
<i>3.2.1 Fishing</i>	22
<i>3.2.2 Local Recreation</i>	22
<i>3.2.3 Water Supply</i>	22
<i>3.2.4 Education</i>	22
<b>4. Economics of the Saba Marine Park</b>	23
4.1 Economics of Yacht Visitors	24
4.2 Economics of Dive Visitors	25
4.3 Economics of Cruise Ship Visitors	25
<b>5. The Relevance of the Saba Marine Park to Saba's Economy</b>	26
<b>6. Recommendations for Enhancing Economic Benefits</b>	27

<b>7. Social Impacts of the Saba Marine Park</b>	29
7.1 Environmental Issues	31
7.2 Social Issues	31
7.3 Economic Issues	31
7.4 Political Issues	32
<b>8. Recommendations for Enhancing Social Benefits</b>	32
<b>9. Discussion and Conclusions</b>	34
<b>References</b>	36

## Summary

The Dutch island of Saba in the North Eastern Caribbean has been surrounded by a protected area since 1987. This area known as the Saba Marine Park was developed as a result of a project initiated in 1984 by the Central Government of the Netherlands Antilles which was aimed at strengthening the economy of Saba through dive tourism. In 1987 the Saba Marine Park (SMP) was officially established through the Marine Environment Ordinance, Saba and within six years became self-financed, by charging user fees, selling souvenirs and accepting donations. In 1994/95 a cost benefit analysis determined that the Park was responsible for generating US \$ 3 million towards the islands Gross Domestic Product of US \$14 million, and continues to play a major role in the sustainable development of the environment, the economy and the social well-being of the islands people. The incomes and expenses of the SMP were itemized and the activities with the greatest benefit/cost ratio calculated to form recommendations for the economic development of the Park.

Visiting divers indicated a preference towards Saba for their diving vacation because of the opportunity to dive in an unspoiled and protected location. A multi-criteria analysis carried out in conjunction with the cost/benefit analysis consolidated local peoples, and visitors opinions of the SMP. These opinions varied , but in general people understood the economic benefits of the Park to the island but stressed that aspects such as communication, education and a wider distribution of benefits from the Marine Park needed developed in the future.

# 1. Introduction

The island of Saba is the smallest of the Netherlands Antilles with an area of approximately five square miles. Saba is situated twenty seven miles south of St. Maarten in the leeward arc of the Lesser Antilles (see map). Being the highest point in the Dutch Kingdom (2855 feet) Saba also contrasts to it's other Dutch counterparts of St. Maarten and St. Eustatius in the north eastern Caribbean Sea and Curacao, Bonaire and Aruba ( now know longer part of the Netherlands Antilles) in the southern Caribbean approximately fifty miles off the coast of Venezuela.



Figure 1. The Lesser Antilles and Caribbean Sea. From Brugman (1995).

The islands origins are volcanic, and the resulting domular topography with its deep valleys carpeted by lush vegetation which fan down from the upper slopes of the island make for a very attractive setting and important asset for encouraging eco-tourism.

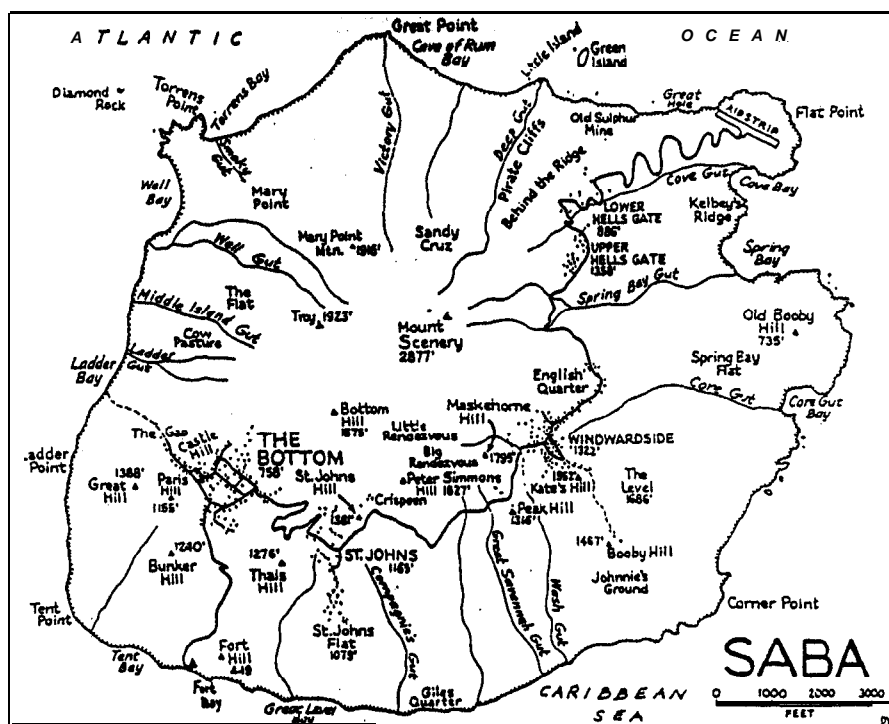


Figure 2. The island of Saba. From Brugman (1995)

The earliest recorded inhabitants of Saba have been connected with a settlement at Fort Bay dating back to  $1175 \pm 65$  years B.C.. A number of explorers in the fourteen, fifteen and sixteen hundreds mentioned Saba in their ships logs. Settlers in the North Eastern Caribbean in the 17th century sought to develop plantations for the supply of sugar, tobacco, coffee, cotton, all of which had great value in the European market, For this reason in 1635 the Dutch took possession of St. Eustatius and in 1640 Saba was colonized from St. Eustatius. In 1665 the island of Saba had a population of 226 of which 37% were Dutch, 37% were Negro and Indian and 24% were Anglo-Saxon (Hartog 1988). Saba changed hands numerous times between the Dutch, French and British until finally in 1816 it came under Dutch rule. The population on Saba has fluctuated over the years from 1807 individuals in 1865 to 958 in 1972 and approximately 1200 in present times.

Sustenance of Saba's inhabitants traditionally came via farming the upper slopes of the island on fertile terraces, fishing, cultivating/ processing and exporting sugarcane and cotton (Hartog 1988).

Saba remained rather isolated until the development of reasonable harbor facilities and a cement road from Fort Bay to The Bottom in 1943 and the completion of the island's airport in 1963. In the late 1960's a vehicle road which links the airport and the harbor and each of the villages, was completed and since Saba has developed very quickly both socially and economically.

The highest point on the island, Mount Scenery, is capped with a cloud forest where humidity and rainfall is high (> 1080mm per annum) this forest is characterized by the mountain mahogany (*Freziera undulata*) tree which has thick spreading bows hosting numerous mosses, ferns and other epiphytic plants. The slopes of the mountain play host to secondary rain forest. Networking across the island are scenic trails once used before the construction of the vehicle road, as the main means of transporting goods from village to village. These days the trails are maintained for hiking.

The coastal area of Saba is very dramatic and for the most part consists of cliff face with the exception of three areas where the man-made concrete road meets the ocean, and, a small gently sloping area at Giles Quarter on the south coast. Consequently, there is little coastal development. The sub-marine area near the coast comprises a narrow shelf consisting of large volcanic boulders, lava flows and overhangs most of which have become encrusted with corals, sponges and algae. Saba's marine environment is also characterized by the existence of a number of under sea mountains which come within twenty five metres of the surface approximately a kilometer off the west coast. These sea mounts and the coastal area from the shoreline to a depth of 60 metres are protected by law and are managed under the auspices of the non-governmental, non-profit, Saba Conservation Foundation as the Saba Marine Park.

## **1.1 The Saba Marine Park**

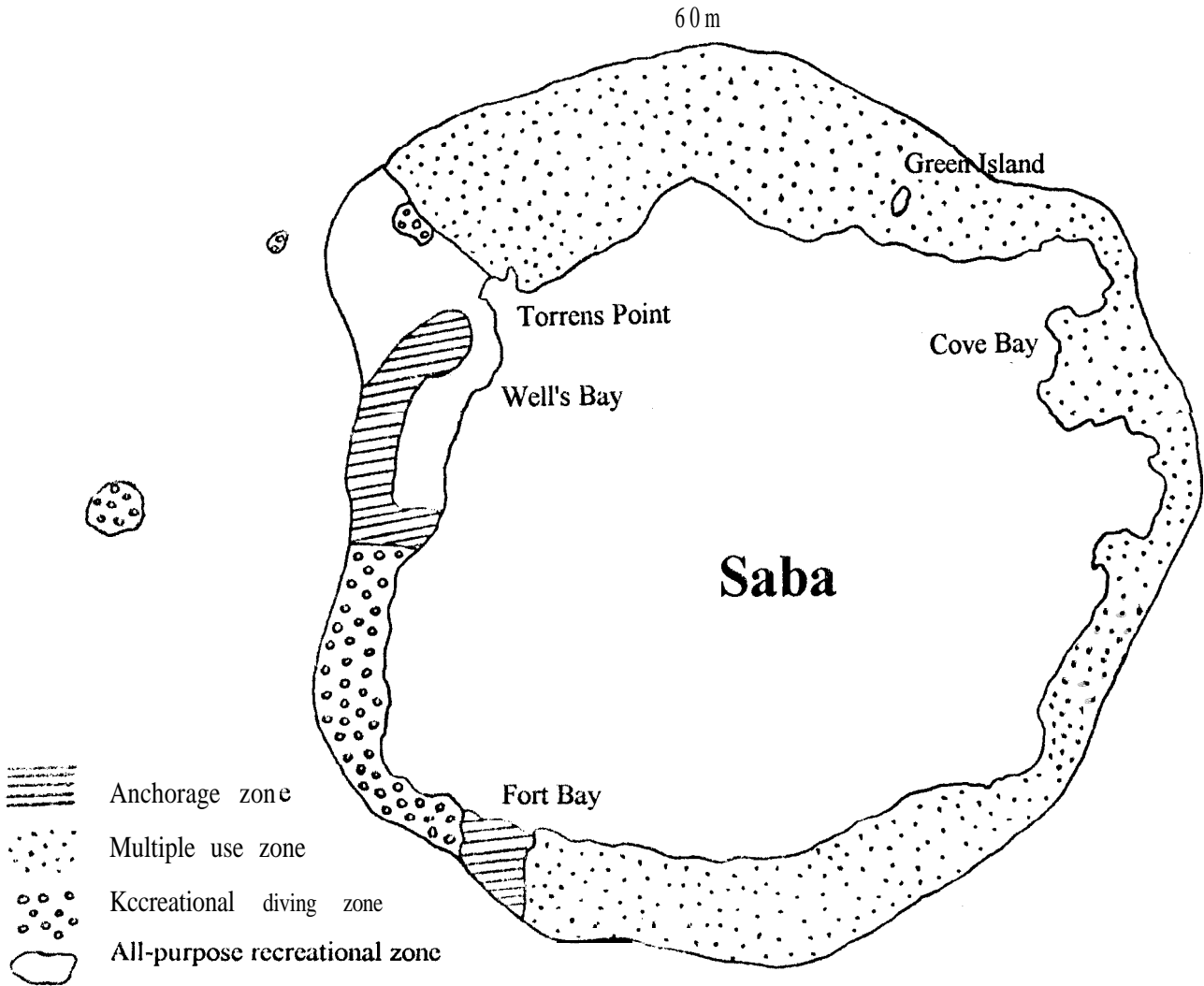
In 1984, the Ministry of Economic Affairs of the central government of the Netherlands Antilles suggested development of the diving industry as one means of strengthening the economy of the island of Saba. The Island Government agreed that development should take place although had reservations about possible impacts on the marine environment. They subsequently joined forces with STINAPA (Netherlands Antilles National Parks Foundation) in order to determine the feasibility of such development. Pilot investigations were carried out to assess the potential for diving tourism and to recommend a strategy for managing the marine resources. These studies resulted in a proposal entitled “Saba Marine Park, a proposal for integrated marine resource management in Saba” (Van't Hof 1991). This proposal was submitted to the Executive Council of Saba in 1985. Upon approval, funding was sought for the establishment of the Saba Marine Park (SMP). The project to establish the SMP began in October 1986 when full funding became available from World Wildlife Fund Netherlands, the Prince Bernhard Fund, the Dutch Minister of Netherlands Antillean and Aruban Affairs, and the Executive Council of Saba. The project to develop the SMP was completed in October 1989 and in April 1990 the Executive Council of Saba delegated the formal administration of the SMP to the Saba Conservation Foundation (SCF).

The Saba Marine Park became the first self-financed marine park in the world (Walker 1993, Van't Hof & Buchan 1996) after the island government withdrew its subsidy for staff salaries in 1993 and since the SMP has been dependent on donations, souvenir sales and visitor fees.

Having been in existence for almost ten years as a fully operational marine protected area, the Saba Marine Park is a good example of present-day conservation: it aims at protecting the marine resources, while at the same time allowing for sustainable use. The main goal of the Saba Marine Park is to preserve and manage Saba's marine resources for the benefit and enjoyment of the people, in perpetuity.



Figure 3. Saba Marine Park Zoning Plan



### 1.1.1 Park Zoning

The Saba Marine Park stretches around the entire island, from a high water mark to a 60m depth contour and includes the sea bed as well as the overlying waters. A zoning system has been applied to acquire the best possible compromise between different uses of the marine environment

*Four zoning classifications exist: (Figure 3)*

*1) A multiple use zone, accommodating both fishing and diving but with limited emphasis on diving. All traditional fish techniques are permitted in this area except spear fishing while using SCUBA.*

*2) Recreational diving zones where line fishing, spearfishing, trap fishing and anchoring are not permitted*

*3) Anchorage zones, where yacht moorings have been placed for the safe anchoring of visiting boats.*

*4) All purpose recreational zone, which incorporates part of the anchoring zone and is intended to accommodate boating, swimming, snorkeling, diving and fishing.*

## **2. Economic Setting**

The currency of Saba is the Netherlands Antilles Guilder which if divided by 1.8 gives it's US \$ equivalent. Most foreign exchange is through the US \$ and this currency is readily accepted by businesses on island.

Based on figures from 1994 the Gross Domestic Product of Saba's Economy is approximately US \$ 14 million. Around US \$8.75 million is generated through the external sector which brings money to the island via exports such as fish and sand, or by the provision of services to island visitors. The internal sector which is responsible for US \$ 5.25 million relates to items and services utilized by the local population, for example the purchase of goods in shops, repairs of domestic and local business commodities and local construction. The money from the external sector is the basis of the internal economy and is used to purchase goods and services on the

island and as a result multiplies through the economy as it changes hands. Framhein 1996, estimated a multiplier of 1.6 to describe how money generates through the local economy.

The net income producers on Saba can be summarized as follows:

## **2.1 Fishing**

At present, there are eight commercial fishermen with four boats, this has varied somewhat over the last few years as the island has developed and many of the fishermen have turned to work in the construction industry (Polunin and Roberts 1993, Roberts (in press)). However, many of these fishermen still fish recreationally and in total there are perhaps about eighty recreational fishermen. Fishing practices are low impact within the Saba Marine Park.. Firstly because of the volume of fishermen is low and commercial boats tend to fish on the Saba Bank (a large submerged atoll approximately 3 miles south of Saba, Meesters 1996) and secondly because of the techniques used: 1) Deep line fishing to depths of 100-150 metres for Red Snapper and Hind. 2) Trawling for Tuna, Wahoo and Dolphin Fish. 3) Line fishing from the shore, which in Saba's case is mostly inaccessible have minimal effect on the SMP whose boundaries stop at a 60m depth.

Trap fishing is limited in the SMP as traps are usually deployed to depths in excess of 100 - 150m, also, most trap fishing occurs on the Saba Bank.

## **2.2 Sand**

Since 1972, there has been a rock crushing operation and quarry situated on the south coast of the island. This operation has more recently employed 8 local people and there is a nominal fee paid to the Government of Saba for the export of building materials. This company also supplies local construction materials.

### **2.3 Tourism**

Tourism is the main stay of Saba's economy. The most recent figures indicate that there were approximately 25,000 non-Saban visitors to the island in 1995 (see Figure 4).

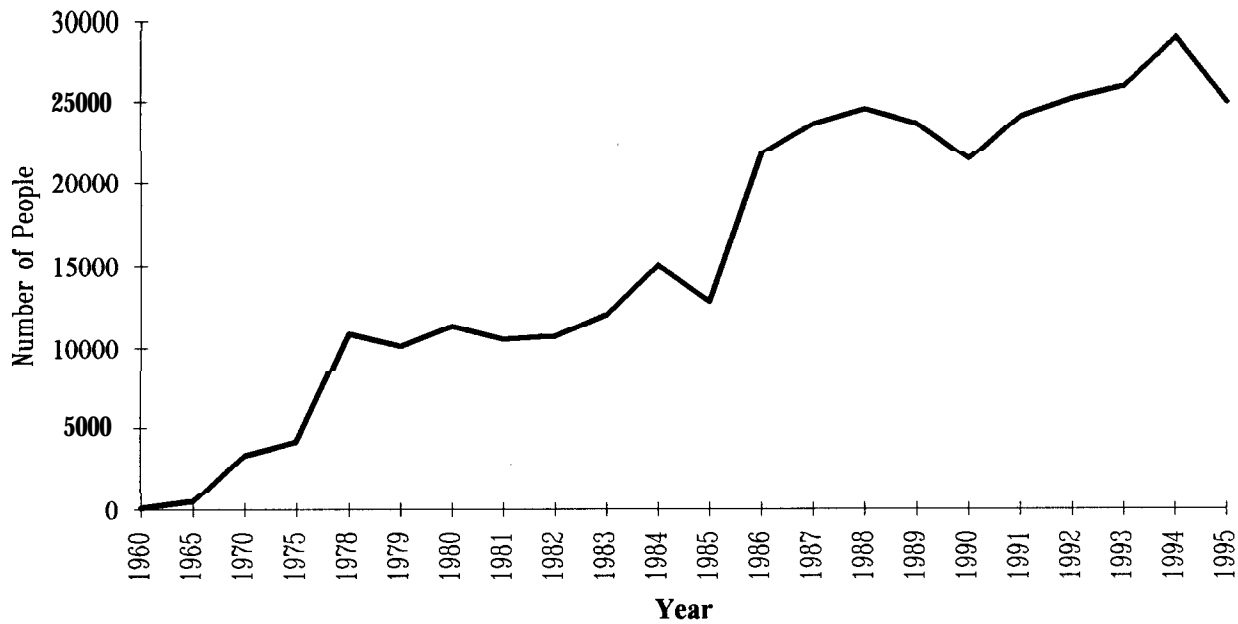
About half of these tourists arrive on Saba by plane, (there are five scheduled 20 seat flights direct from St. Maarten daily to Saba) the other half arrive by day ferry from St.Maarten which carry 50-100 passengers at a time, or by small cruise ships which stop for the day on Saba while on longer cruises of the leeward islands. These boats generally carry up to 150 passengers.

Around five thousand of these visitors come to Saba to dive and another 2500 to utilize the park in other ways such as boating, swimming and snorkeling. A large proportion of visitors come to the island to hike, sightsee and shop.

The trend for visitor arrivals to Saba has been one of a gradual increase since the early 1960's' with some minor fluctuations during this period. According to Charles and Griffith 1994 approximately 74% of visitors to Saba are first time travelers. . 47% of visitors are on prepaid packages. More than half (52% of visitors stay in hotels while another 36% utilize villas, and other established accommodation. Friends and relatives accommodate approximately 10% of the visitors.

Based on responses to a visitor survey by Charles and Griffith (1994) the average daily expenditure was calculated at US \$ 89.50 for people from North America and US \$ 65.00 for Europeans.

Figure 4 . Showing arrivals on Saba from 1960 • 1995. (Data source: Saba Integrated Tourism Development Master Plan Draft 1996)



## 2.4 Offshore Companies

There are only a few offshore companies on Saba. Up until now communications logistics, shipping costs and a lack of trained local personnel have restricted the development of offshore companies. Six main offshore companies exist, three of these are dive operations owned and run by non-locals these companies tend also to employ skilled foreign labor. The other offshore companies include one which is involved in the distribution of domestic food items from the USA to other islands in the Caribbean (acting as a broker for US companies). The necessity for this company to be located in the USA is minimal and the owner has exposed himself to the extra expense of operating on Saba because of his wish to live on the island. Another company is concerned with the export of rock and sand from the island and supplies building materials for local construction. Finally, there has been an offshore medical school established since late 1993

with approximately 200 students and faculty. This is a low impact business in the environmental sense and has been responsible for great benefits for a number of local people. This influx of people to the island has resulted in increased construction, better communications, better utilities, expanded food markets, and increased income to those renting accommodation.

## **2.5 Retirees and, part-time settlers from overseas**

Saba is an attractive retreat for many retirees and a number of homes are owned by expatriates who live either full-time or part-time on the island. House construction, maintenance and living expenses for these people contributes to the island's economy.

## **2.6 Art Work**

Saba also attracts many artists because of its quaint and picturesque natural setting, and the infrastructure exists for local works to be sold through an art foundation or in local shops.

## **2.6 Land Rentals**

Because of its position and height Saba is a good vantage point for telecommunications. In 1972 Cable and Wireless built a microwave relay station at the top of Mount Scenery and to the present day lease the land from the local Government.

## **2.7 Money transfer from other governments and institutions**

Saba still depends on some finances from the Netherlands and the Central Government of the Netherlands Antilles in Curacao for major utilities projects and emergency funding. Many of the conservation and cultural projects taking place on Saba are funded by overseas funding organizations.

An estimation of income generation by the external sector can be shown (after Framheim 1996)

Tourism	US \$4.1 million
Government Subsidies	US \$2.2 million
Offshore Companies	US \$1.8 million
Export	US \$0.6 million
<u>Other</u>	<u>US \$0.05 million</u>
<u>TOTAL</u>	<u>US \$8.75 million</u>

The work force on Saba consists of about 600 persons (approximately 50% of the population). About two thirds are employed in the public sector and about one quarter in the tourist sector.

### **3. Resource Use**

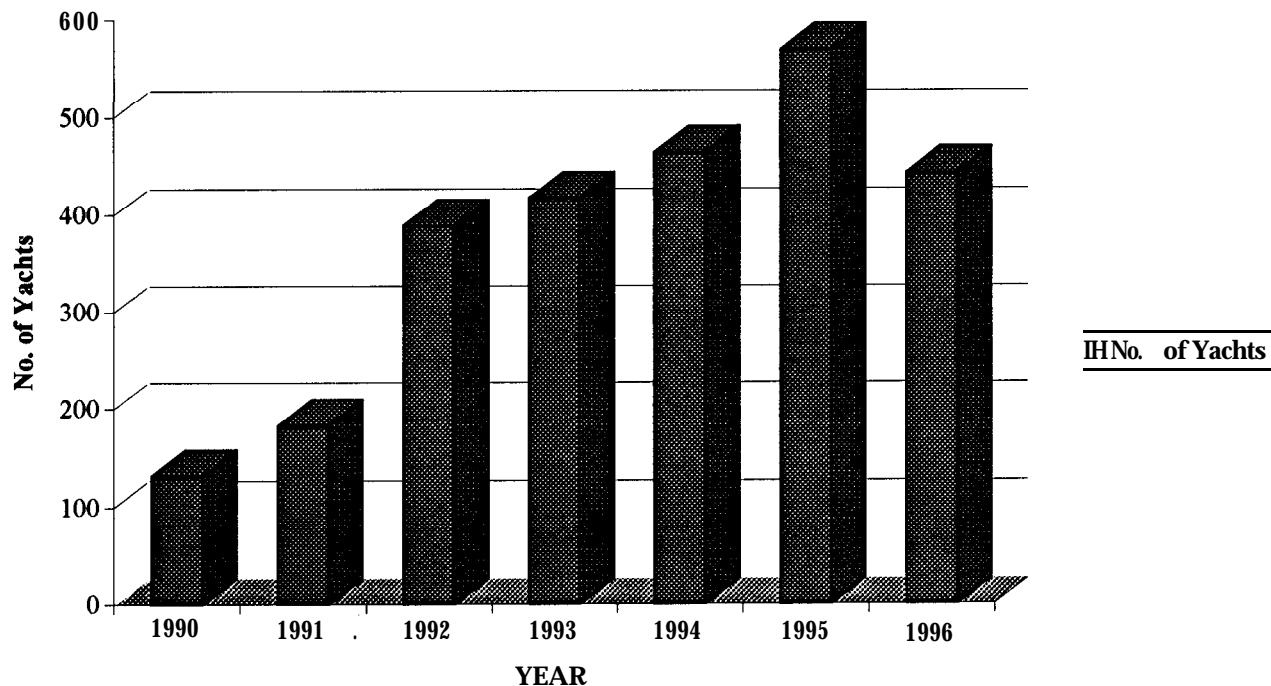
Described below are the resource uses of the Saba Marine Park. Each of these uses has an economic impact for the island and the local population.

#### **3.1 Resource use by Tourists**

##### **3.1.1 Yachts**

The general trend for yacht visitors has been an increase since 1990 when statistics were first kept by the SMP. The development of French St. Martin as a yachting base, a keen interest in diving by yachters, along with permanent overnight moorings in the Saba Marine Park increased visitation to Saba. A drop in visitation has only been seen following major hurricane activity in the region (for example after Hurricane Hugo in 1989 and Hurricanes Luis and Marilyn in 1995).

Figure 5. Shows yacht visitation statistics for the Saba Marine Park from 1990 to 1996..



### 3.1.2 SCUBA Divers

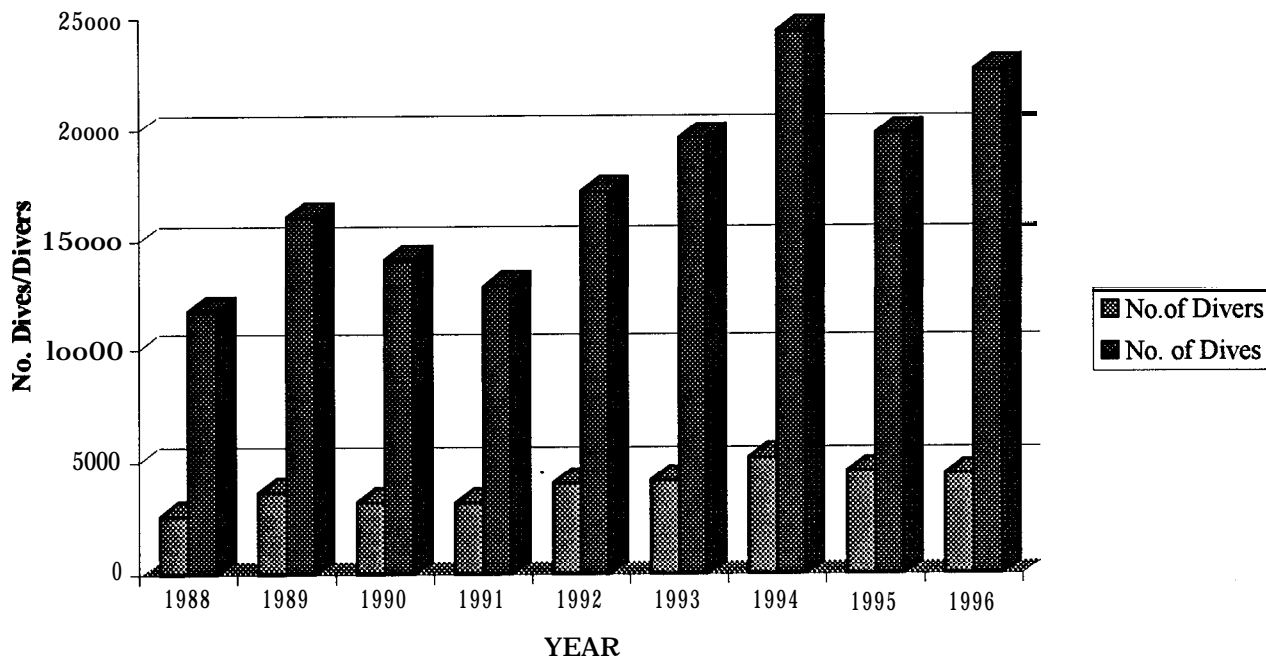
The number of divers utilizing the Saba Marine Park has varied from year to year over the last nine years (see Table 1) usually due to outside influence although the general trend is an increase in diving activity. For example in 1990/1991 following Hurricane Hugo there were less divers visiting Saba, in addition, there were less Americans traveling during the Gulf War. The years following, there was a build up of diving visitors until the numbers peaked in 1994. The last quarter of 1995 and the first of 1996 were very quiet following Hurricanes Luis and Marilyn. However, proportionally divers visiting Saba were doing more dives in 1996 which indicates an increase in overnight visitors.



Table 1. Dive/diver and yacht statistics for the Saba Marine Park.

	YEAR								
	1996	1995	1994	1993	1992	1991	1990	1989	1988
<b>Number of Divers</b>	4428	4544	5165	4145	4025	3159	3192	3624	2601
<b>Numbers of Dives</b>	22659	19795	24383	19607	17202	12952	14121	16060	11664
<b>Average number of Dives/Diver</b>	5.12	4.36	4.72	4.73	4.27	4.1	4.42	4.43	4.48
<b>Number of Yachts</b>	442	568	463	416	388	182	131	?	?

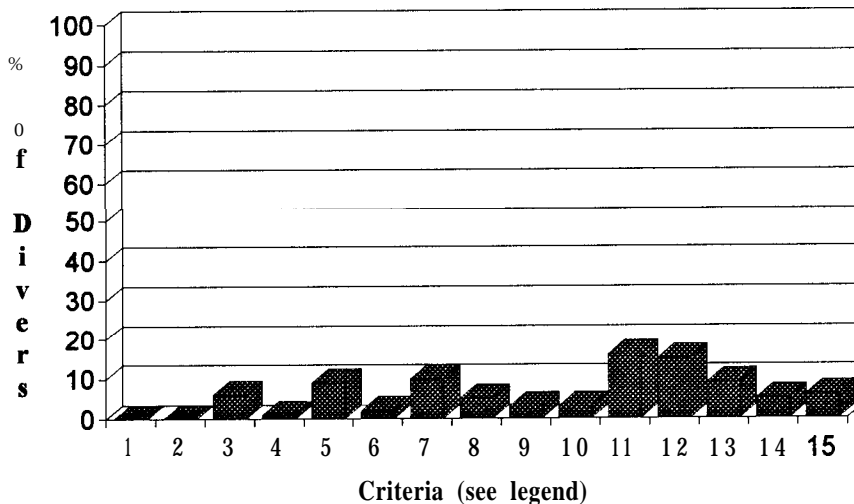
Figure 6. Shows the number of divers and dives being carried out in the Saba Marine Park between 1988 and 1996.



A survey completed in 1995 by Framhein asked a variety of question of divers (see appendix I). The sample size was approximately two hundred but was limited in its scope being biased more so to divers staying on island rather that visiting off sail boats.

Most divers who visit Saba are from the United States, and most hear about Saba through word of mouth or reading articles in the diving press and tourist magazines. Visiting divers rated how important certain attractions of Saba were for their diving holiday on a scale of 1 to 5, where 1 = Of utmost importance, 2 = Very important, 3 = Important, 4 = Of some importance, 5 = Not important. The results from this section are summarized in the following figures.

Figure 7. Showing criteria (listed below) rated as being of utmost importance to divers visiting the Saba Marine Park.

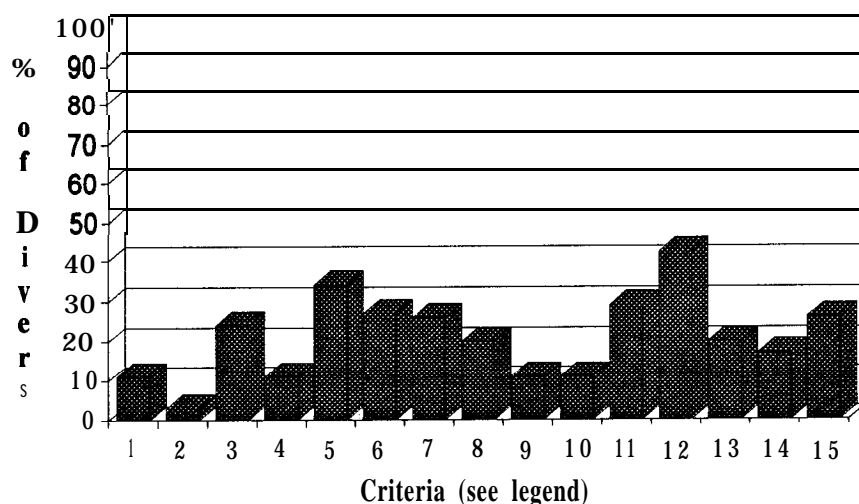


- |                              |                                |                                 |
|------------------------------|--------------------------------|---------------------------------|
| 1 • Dive Site diversity      | 6 - Abundance of other species | 11 • Combining other islands    |
| 2 • Condition of reef        | 7 - Accessibility to sites     | 12 • cost of trip               |
| 3 • Water visibility         | 8 • Service provided           | 13 • Limited resort development |
| 4 - Fish abundance/diversity | 9 • Lack of congestion         | 14 • No mass tourism            |
| 5 • Presence of big fish     | 10 • Protected Area            | 15 • Quiet getaway              |

Generally, a low percentage of divers surveyed rated the criteria above **of utmost importance** in deciding to dive in Saba. Criteria which stand out in the figure above include the cost of the dive trip and the possibility of combining other islands with a visit to Saba. These results may reflect some bias as a number of those surveyed were day visitors who visited Saba specifically to dive

from other destinations close by where they are spending the majority of their vacation. Limited resort development was an attraction for 10% of those surveyed and easy access to dive sites also rated highly for 10% of divers. Good water visibility and the presence of big fish which relates somewhat to the protection of Saba’s marine environment also rated highly relative to other criteria.

Figure 8. Showing criteria (listed below) rated as being very important to divers visiting the Saba Marine Park..

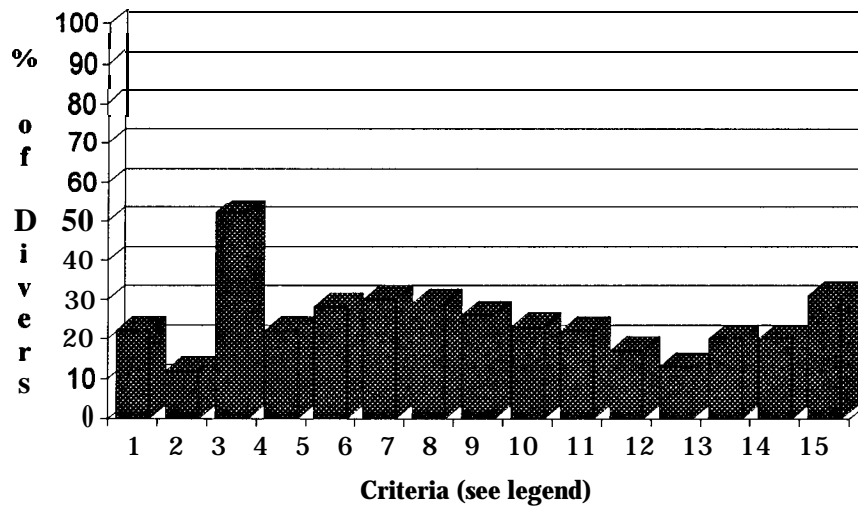


- |                              |                                |                                 |
|------------------------------|--------------------------------|---------------------------------|
| 1 ▪ Dive Site diversity      | 6 ▪ Abundance of other species | 11 ▪ Combining other islands    |
| 2 ▪ Condition of reef        | 7 ▪ Accessibility to sites     | 12 ▪ cost of trip               |
| 3 ▪ Water visibility         | 8 ▪ Service provided           | 13 ▪ Limited resort development |
| 4 ▪ Fish abundance/diversity | 9 ▪ Lack of congestion         | 14 ▪ No mass tourism            |
| 5 ▪ Presence of big fish     | 10 ▪ Protected Area            | 15 ▪ Quiet getaway              |

More divers rated the listed criteria as being **very important** on the 1 to 5 scale, specifically, the cost of their trip, the accessibility of dive sites, water visibility and that Saba is a quiet getaway. Interestingly, the fact that the marine area around Saba is protected was only very important to approximately 10% of divers and the condition of the reef was rated even lower at around 2%. In

contradiction to this many divers were attracted to Saba because of the presence of big fish and abundance of other species. It is difficult to separate these criteria as generally the presence of big fish and the abundance of reef organisms is dependent on the healthy condition of the reef which in turn is a result of limited resource use or controlled reef protection and management.

Figure 9. Showing criteria (listed below) rated as being important to divers visiting the Saba Marine Park.

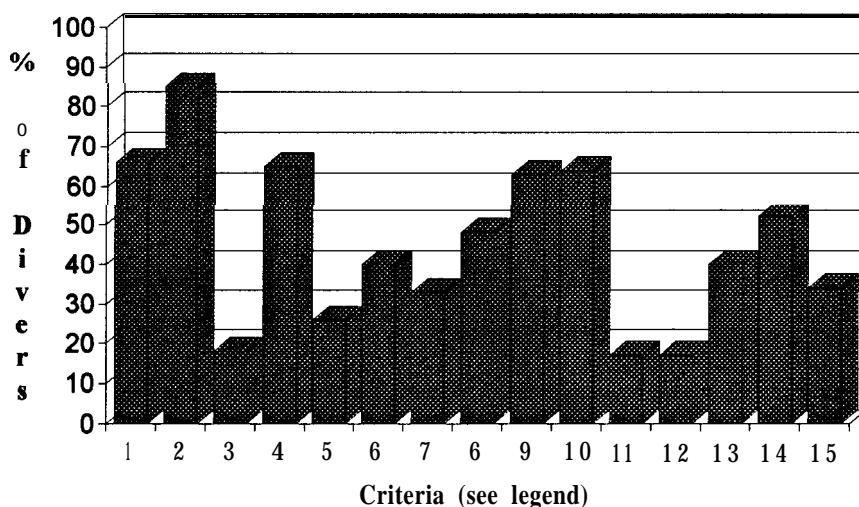


- |                              |                                |                                 |
|------------------------------|--------------------------------|---------------------------------|
| 1 - Dive Site diversity      | 6 - Abundance of other species | 11 - Combining other islands    |
| 2 - Condition of reef        | 7 - Accessibility to sites     | 12 - cost of trip               |
| 3 - Water visibility         | 8 - Service provided           | 13 - Limited resort development |
| 4 - Fish abundance/diversity | 9 - Lack of congestion         | 14 - No mass tourism            |
| 5 - Presence of big fish     | 10 - Protected Area            | 15 - Quiet getaway              |

Divers from the USA and Europe chose destinations in the Caribbean for their dive holidays because the waters are warm and generally clear. Over half of the divers surveyed stated that water visibility was **important** in making their decision to dive in the Saba Marine Park. The abundance and diversity of fish, the presence of big fish and the abundance of other species also rated highly. 20% of divers rated the area being protected as important and 30% preferred that

Saba was a quiet dive destination with 21% appreciating the lack of congestion or crowding at the dive sites.

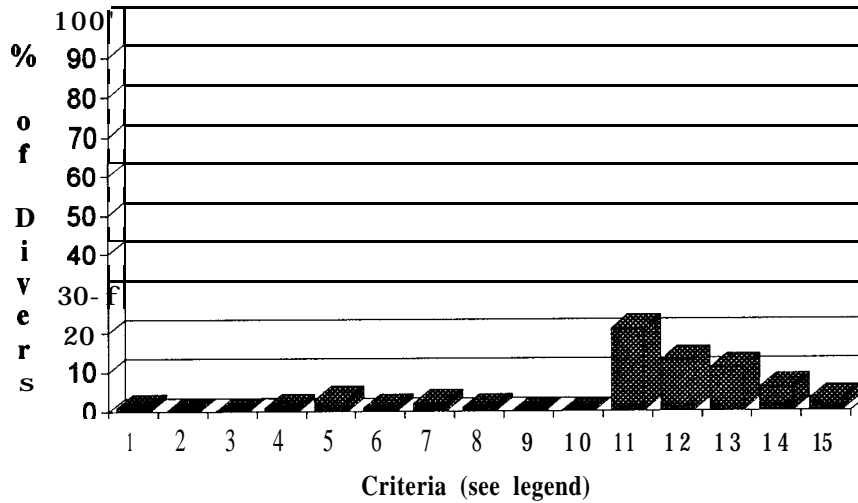
Figure 10. Showing criteria (listed below) rated as being of some importance to divers visiting the Saba Marine Park.



- |                              |                                |                                 |
|------------------------------|--------------------------------|---------------------------------|
| 1 - Dive Site diversity      | 6 - Abundance of other species | 11 - Combining other islands    |
| 2 - Condition of reef        | 7 - Accessibility to sites     | 12 - cost of trip               |
| 3 - Water visibility         | 8 - Service provided           | 13 - Limited resort development |
| 4 - Fish abundance/diversity | 9 - Lack of congestion         | 14 - No mass tourism            |
| 5 - Presence of big fish     | 10 - Protected Area            | 15 - Quiet getaway              |

Of those surveyed, the majority rated the criteria above as being only **of some importance** to them choosing Saba as a dive destination. It seems that most of those interviewed do not relate general reef condition, the lack of congestion (less diver impact) and the fact that the area is protected to the abundance and diversity of creatures on the reef, although this is inferred as the decision to dive in the SMP was to encounter large fish and a diversity of reef stocks.

Figure 11. Showing criteria (listed below) rated as being of no importance to divers visiting the Saba Marine Park.



- |                              |                                |                                 |
|------------------------------|--------------------------------|---------------------------------|
| 1 - Dive Site diversity      | 6 - Abundance of other species | 11 - Combining other islands    |
| 2 - Condition of reef        | 7 - Accessibility to sites     | 12 - cost of trip               |
| 3 - Water visibility         | 8 - Service provided           | 13 - Limited resort development |
| 4 - Fish abundance/diversity | 9 - Lack of congestion         | 14 - No mass tourism            |
| 5 - Presence of big fish     | 10 - Protected Area            | 15 - Quiet getaway              |

Only the last five criteria were rated to any degree as being **of no importance**. At least 20% of those surveyed were staying on Saba only, for the duration of their holiday and therefore had no intentions of visiting other islands. Limited resort development, no mass tourism and a quiet getaway are likely to be of little importance to a small percentage of day trippers and this is probably why these factors are represented in the figure above.

### **3.1.3 Cruise Ship Tourism**

The number of cruise ship calls to Saba per year has varied since 1987 but has been on a steady decrease since 1993 when there were around 45 visits. In the years following this figure reduced to around 30 in 1995.

Saba attracts only small cruise ships carrying a maximum of 100 - 150 passengers. The size of ship is limited by the local infrastructure i.e.. the number of taxis, the anchorage facilities etc. and this control is of benefit to the island in that it limits commercial development which would be contradictory to the island's quiet and quaint attraction. During cruise ship visits divers are required to dive with local shops. Taxis are utilized to the full and souvenir shops, bars and restaurants benefit.

## **3.2 Resource use by Locals**

**3.2.1 Fishing** - the Saban people were historically good at maintaining their fish stocks. The existence of the park prevents foreign commercial vessels from fishing in certain areas of the park. Which will maintain fish stocks for the future and creates a rich marine environment for visiting divers.

**3.2.2 Local Recreation** - local people utilize each of the three areas where the road reaches the ocean on Saba. Well's Bay (see figure 2) has a seasonal beach, Cove Bay a paddling area and recreational building, Fort Bay has the islands harbor and local anchorage area for recreational fishermen to utilize. It also has a shallow area suitable for swimming. Only a limited number of local people SCUBA dive at present.

**3.2.3 Water Supply** - the local desalination plant processes water from the SMP.

**3.2.4 Education** - slide shows are given weekly to visitors and locals, classes are often run at the local schools, and the SMP taken part in an international coastal cleanup each year which involves local volunteers.

## 4. Economics of the Saba Marine Park

Resource use of the Saba Marine Park can be presented in economic terms by developing a benefit/cost ratio through analyzing income and expense. A benefit / cost ratio below one indicates that this resource use is non profitable and costs the SMP more that is returned through this activity.

When we look at one years itemized income / expenses (1994) (Table 2) we can determine an income and expense ratio and calculate the net income from each of the users of the Saba Marine Park.

Table 2. Saba Marine Park Income versus Expense for different user groups.

TOURISM USE	INCOME	EXPENSE	NET INCOME	INCOME/EXPENSE RATIO
Dive tourists	\$73,000	\$36,000	\$37,000	2
Yacht tourists	\$ 9,000	\$ 39,000	-\$ 30,000	0.2
Cruise Ship tourists	\$ 3,000	\$ 2,000	\$ 1,000	1.5
Public Relations	\$ 0	\$ 4,000	-\$ 4,000	-
Recompression Chamber*	\$ 13,500	\$ 4,500	\$ 9,000	3
Tourism TOTAL	\$ 98,500	\$85,500	\$ 13,000	1.2
<b>LOCAL USE</b>				
Recreation	\$ 0	\$ 0	\$ 0	-
Fishing	\$ 0	\$ 2,000	-\$ 2,000	-
Drinking water	\$ 0	\$ 1,000	-\$ 1,000	-
Education	\$ 0	\$ 6,000	-\$ 6,000	-
Chamber Use*	\$ 27,000	\$ 28,500	-\$ 1,500	0.95
Local use TOTAL	\$ 27,000	\$ 37,500	-\$ 10,500	0.7
<b>OTHERS</b>				
Donations	\$ 11,000	\$ 3,000	\$ 8,000	3.7
Research	\$ 12,000	\$ 23,000	-\$ 11,000	0.5
Miscellaneous	\$ 4,000	\$ 3,500	\$ 500	1.1
Others TOTAL	\$ 27,000	\$ 29,500	-\$ 2,500	0.9
<b>TOTAL</b>	<b>\$152,500</b>	<b>\$152,500</b>	<b>\$ 0</b>	<b>1</b>



\* In 1989 the Dutch Navy made a donation of a Hyperbaric Chamber to the island of Saba. After construction of a building to house the chamber and the chamber being put in working order the responsibility for the maintenance and administration of the chamber was designated to the SMP, since then there have been limited profits for the SMP. Most profit goes back into the maintenance of the facility and the remainder can be used for general SMP use

The calculations in this table isolate the most beneficial user groups of the Saba Marine Park to the Saba Marine Park. Those values greater than one for the benefit/cost ratio show those uses that are economically beneficial to the SMP where as those with values less than one show activities which ultimately cost the SMP. Some expenses can be justified when accounting for the overall island benefits.

Cruise ship tourist makes the SMP \$ 1.5 for every \$ 1 spent. And for this particular year the recompression Chamber \$ 3 for every \$ 1 spent by the SMP for it's maintenance and up keep. Other valuable income to the SMP included donations with an benefit/cost ratio of 3.7 making US \$3.70 for every US \$1 spent.

Two thirds (US \$100,000) of the SMP income comes from tourism. Dive tourists generate half of the SMP income. Yacht and Cruise ship tourists bring an income of approximately US \$12,000

#### **4.1 Economics of Yacht Visitors**

Framhein (1996) looked at great depth into the economics of the Saba Marine Park and analyzed the costs and benefits of the main user groups of the SMP. It was estimated that it costs the SMP \$39,000 per year to manage yacht visitors coming to Saba. Expenses include the cost of mooring supplies and maintenance, the production and handing out of informative brochures, the time spent patrolling the yacht anchorage area and the expense of running the SMP boat, the time spent checking yachts in and giving verbal interpretations. The income to the SMP from yachts is minimal with fees for 1994 totaling US \$9000 or approximately one quarter of the expense, and perhaps a gross \$4000 from souvenir purchases made by yacht visitors. The appearance of Saba's mountainous topography and lush vegetation along with a spectacularly scenic anchorage will

always attract yachts to Saba and the benefit to the island as a whole is reasonable (approximately US \$100,000 per year) and has potential to grow. There are also return visitors to the island who first visited by yacht but then decided to return and stay on island. For these reasons it is necessary to accept and manage yacht visitors. One means of making management of yachts more reasonable for the SMP is to charge greater fees, there is still some leeway in charging more as Saba has been very reasonable in comparison to neighboring islands in its charges for overnight mooring. Framhein (1996) showed a willingness to pay of \$ 10 per person per week by yacht visitors.

#### **4.2 Economics of Dive Visitors**

Dive tourism is an important income not only to the island but also the SMP. For each dollar the SMP spends on Dive tourists \$ 2 were made in 1994. The income through visiting divers has proven to be very successful in the economic sense. Framhein's survey showed an average willingness to pay of \$5.7 per person per dive. Although the sample size was low in deriving this figure it indicated that there is some potential to increase the fee without discouraging dive tourists. This increase could certainly be in line with local inflation.

#### **4.3 Economics of Cruise ship visitors**

The recent trend has been a reduction in cruise ship visits to Saba and the Saba Marine Park. There are a number of likely reasons for this which include generally poor sea conditions in the winter months making transport of passengers from the anchorage to the shore difficult, uncomfortable and sometimes hazardous, the development of new destinations with better cruise ship facilities, and the condition of the Fort Bay harbor. The income produced for the SMP via cruise ship visits is reasonable with an benefit/cost ratio of 1.5. Saba is a very inexpensive port of call for the cruise ship companies themselves and there is certainly room to increase the marine park fee for boats using SMP facilities.

## **5. The Relevance of the Saba Marine Park to Saba's Economy**

The Saba Marine Park employs only three people directly. Two of these employees at present are non-local because of the lack of relevant education in the local population. In the future it is likely that the park will employ some other local people.

Indirectly the park is responsible for many tourism related jobs. There is little data available about the numbers of employees working in the tourist sector in Saba because much of the related employment is seasonal or part-time. An estimate of 150 workers has been made by (Tourism Planning and Research Associates 1996) and includes accommodation staff, restaurants, dive shops, handicraft shops, taxi drivers and suppliers to the trade.

It is important to consider the fact that dive tourism would still be popular on the island if the SMP did not exist, however Framhein suggests that the SMP is responsible for encouraging at least half of the dive tourists to the island as divers come to see a near pristine marine environment in an uncrowded location. Therefore, employees and entrepreneurs in the tourist sector benefit from the existence of the Saba Marine Park. It would also be likely that without the SMP management economic benefits through use of the marine resources around the island of Saba would be short lived. It seems that in general the distribution of benefits is wide to those within the tourist sector including the dive operators, hoteliers, taxi drivers and shop owners. Since the early 1990's Saba has developed a strong, growing economy and local people have a reasonably high standard of living.

There is no evidence to suggest that there has been a loss of revenue for anyone on Saba due to any restrictions imposed by the SMP on resource use. The only profession directly affected is fishing, however this generally occurs outside the SMP area and is therefore not affected by local marine environment ordinances relating to the Park, restrictions are more an inconvenience than an economic hardship for the recreational fishermen who fish for their own consumption but are restricted within the SMP to areas usually exposed to the wind and which therefore have rougher sea conditions.

The income generation for the SMP is based on results from Framhein (1995) who carried out extensive interviews and studies of those directly connected with tourism on Saba. Table 6 below takes into account the multiplier factor estimated at 1.6 which accounts for the re-circulation of moneys paid to local business's from outside the island economy which is then spent on island and changes hands a number of times before leaking out of the economy to other islands.

Table 3. Income Generation for Saba from SMP Use.

User Group/Activity	INCOME IN US \$	INCOME WITH MULTIPLIER FACTOR
Dive Tourists	\$ 1,640,000	\$2,624,000
Yacht Tourists	\$ 100,000	\$ 160,000
Cruise Ship Tourists	\$ 70,000	\$ 112,000
Chamber	\$ 46,000	\$ 74,000
Fishing	\$ 25,000	\$ 40,000
Donations	\$ 11,000	\$ 18,000
Research	\$ 11,000	\$ 18,000
<b>TOTAL</b>	<b>\$ 1,903,000</b>	<b>\$ 3,046,000</b>

## 6. Recommendations for Enhancing Economic Benefits

User groups with a high benefit/cost ratio should be encouraged, for example diving could be developed and encouraged on the basis of sound research into diving related impacts. Roberts and Hawkins (1995) have shown that to date minimal damage has been done by divers in the SMP which would indicate that there is room to develop and increase the number of divers utilizing the SMP as long as dive briefings and educational slide shows given by dive masters and park staff respectively, are as effective in preventing damaging diving practices. Conservative development of dive tourism would be of general benefit.

User groups with a low income / expense ratio (below 1) should be discouraged unless they are beneficial to the island as a whole or unless compensations can be made through different management practices such as increasing fees.

It may be possible to improve the quality of the SMP by providing other services to users or creating new visitor attractions such as a visitors center, where educational programs could be run for visitors and locals. Other enhancing features may include providing a sail boat dock with fuel, water and electricity and/or more overnight moorings.

## 7. Social Impacts of the Saba Marine Park

Much of the following information is based on a more detailed and extensive report by Fernandes (1996) who carried out a multi-criteria analysis on Saba, looking at the Social, Economic and Environmental impacts of the Saba Marine Park.

Within the overall goal of the Saba Marine Park which is to preserve Saba's marine resources for the benefit and enjoyment of the people in perpetuity. Local people were asked to voice their opinions on the management and existence of the Saba Marine Park. The Saban community in general largely agreed on what should be the most important objectives of the SMP.

Issues of importance were isolated through interviews with the general population, those in government and individuals directly linked with the operations of the SMP. The community derived objectives were summarized as:

ECOLOGICAL SUSTAINABILITY • which includes

Minimizing reef damage- minimizing physical and disease damage to benthic organisms

Maximizing fish abundance- maximize the number and size of the greatest diversity of fish species possible.

Maximizing water quality- prevent or minimize all organic or inorganic anthropogenic pollution.

ECONOMIC BENEFITS • which relates to

Ensuring that the SMP has a positive economic effect on the community of Saba.

SOCIAL ACCEPTABILITY - which includes

Increased understanding - increase awareness and understanding within Saba for the value and functioning of the marine environment, marine resource management practices in general and SMP in particular.

Children - increasing children's understanding of the marine environment, marine resource management and SMP

Public- increasing the awareness of the community as to the value and functioning of their marine environment and marine park.

Government- increasing the awareness of government decision makers as to the value and functioning of Saba's marine environment and SMP particularly as it pertains to government decisions which may impact the park.

Maximize user access - allow for maximum multiple use of SMP whilst minimizing conflicts between different users.

Global Model - the SMP provides a global example of a self-financing, well functioning marine park from which people can learn.

Provide education opportunities- the global community can learn from SMP through education both directly (hands on) and indirectly (via publications).

Provide research opportunities - both the relatively pristine environment and the marine park itself can be the focus for, respectively, biological and management oriented research world wide.

## **7.1 Environmental Issues**

Overall, the population of Saba stressed that the Saba Marine Park was important in the maintenance of coastal ecosystems. The park has control and should be aware that over use is possible in the future. People were also aware that there has been a decrease in anchor and diver damage through the provision of moorings and the education of visiting divers. The SMP has an important role in patrolling and law enforcement that could be improved.

## **7.2 Social Issues**

Many people felt that there was not enough communication and interaction between the SMP and the local population. It was evident however from a majority of those surveyed that the SMP attracts a desirable type of visitor to the island. In general there is more support for the marine park from fishermen as the economic benefits through tourism become apparent, and, as it is understood that minimal restrictions are put on them. Some locals also indicated that they were not interested in the SMP or indeed didn't know about its work. This indicates some major communication problems on the island and that many of the educational goals of the park are not being met. There was some concern about local access to resources, which generally resulted from misunderstandings of the marine park legislation. It was stressed that the Park does provide an example internationally as a fully functioning self-financed marine park and disseminates information worldwide, indeed some local people were proud of the SMP's international recognition, but there was concern that the local population, especially the children, could benefit more educationally from the existence of the park.

## **7.3 Economic Issues**

People in general were aware that economic development had taken place with the establishment of the park. The SMP's financial independence means there is no pressure on limited government funds. More visitors has lead to increased foreign investment creating foreign exchange but also pressures for development. Some people surveyed commented that the general standard of living



had improved on the island, in addition, people were engaged in better paid jobs. Some concerns were voiced about the cost of living increasing, and that the SMP should generate more income for the island and that there should be other options for commercial use of the Park.

#### **7.4 Political Issues**

The Saba Marine Park should continue to provide advice to government regarding adjacent terrestrial developments. The park should also be politically neutral and enforce government approved laws. Some individuals surveyed wanted better distribution of benefits and jobs, and felt that a terrestrial park would be of further benefit to the island.

### **8. Recommendations for Enhancing Social Benefits**

Some of the major concerns and suggestions by the local population can be listed and should be incorporated in the future development plan for the Saba Marine Park in order to gain more social acceptability.

1) Increased education supporting field trips, incorporation of classes at school, swimming and snorkel lessons, SCUBA diving lessons, facilitate informing educators and children about employment in the marine science and management field, make researchers available to schools for talks, instigate volunteer program.

2) Increase interaction between SMP and local community, make more use of media, sponsor events, researchers press releases, fishing moorings, share information of use to local businesses, invite locals to slide shows, let dive shops know that SMP appreciates assistance.

3) There should be greater interaction between SMP and Government decision makers, give advice.

4) Staff of the SMP should make greater effort to enforce compliance with law and introduce rules and regulations with regard to upstream impacts.

5) Research into carrying capacity should be instigated.

6) SMP should make sure that Environmental Impact Assessment is a rigorous process for coastal development.

## 9. Discussion and Conclusions

Going into its tenth year the Saba Marine Park has influenced and played a major role in the economy and social well being of Saba's island community.

Table 4. The contribution of the Saba Marine Park to the tourist sector of Saba's economy.

	EXTERNAL SECTOR	TOTAL ECONOMY	%	%
Saba Marine Park	1.9 million	3.0 million	21%	}Total }47%
Tourism	2.2 million	3.6 million	26%	
Private Sector	2.5 million	4.0 million	28% I	28% I
Government Subsidies	2.2 million	3.5 million	25%	25%
<b>TOTAL ECONOMY</b>	<b>8.8 million</b>	<b>14.0 million</b>	<b>100%</b>	<b>100%</b>

The Saba Marine Park through its management and attraction to visitors generates almost half the tourist income to the island which in turn is approximately half of the GDP (Table 4.).

Although viewed skeptically by the local population in its initial phase of development and meeting with some strong opposition the Saba Marine Park quickly developed into an attraction for eco-tourist type divers and the economic benefits showed in a very short time. The significance of the self-financing status was great as it showed an independence from limited local financial resources and development of the Saba Marine Park has shown that people are willing to pay for conservation efforts. The diver surveys indicated that many divers were not aware of the Marine Parks significance in its protection of the marine environment, however they planned their trips to Saba on the understanding that they would have an impressive diving experience on near pristine coral reefs with an abundance of fauna, but did not relate this to the efforts or existence of the park. This very fact indicates that the Marine Park has lacked in its education goals and the dissemination of information and interpretation about the Park. This is an opinion shared by many local people and the results of these surveys should act as guidelines to the future development plans of the SMP.

In general, people are aware of the economic significance of the park, most of the population do not feel restricted by the regulations governing use of the park, because there are very few limitations for local people.

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**PP. 50**

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