



The Economics  
of Ecosystems  
and Biodiversity  
on Bonaire

# Tourism value of ecosystems in Bonaire



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This study is part of the “Economics of Ecosystems and Biodiversity Netherlands” (TEEB NL) study. It is being conducted for the Caribbean Netherlands on behalf of the Dutch Ministry of Economic Affairs.

## The Challenge

Bonairean ecosystems support touristic activities that depend on the quality of the natural environment, such as diving, snorkelling, kayaking, boating, enjoying beaches, and participating in land activities. The tourism sector is an industry with substantial size and financial contribution to the economy of Bonaire. However, the economic value of the contribution of nature to Bonaire’s tourism has never been quantified, nor have the most important aspects of Bonairean nature for tourism been identified. It is essential that the economic value of the ecosystem service to tourism and the dependence of tourism on Bonairean ecosystems while impacting these same ecosystems be determined in order to further assist policy-makers in understanding this crucial relationship and support them in wise long-term decision-making.

## The Approach

To determine the value of Bonairean ecosystems for the tourism industry a survey among tourists visiting Bonaire is conducted. This study estimates the average expenditures of these visitors, as well as their Willingness-To-Pay (WTP) for protection of Bonairean nature. The result of this survey also elucidates tourists’ perceived value of different aspects of Bonairean nature. The socio-economic value of the ecosystem services for tourism is combined with spatial data to determine which ecosystems are the most economically valuable with regards to tourism.

## Results & Recommendations

The expenditure by tourists on Bonaire is found to be around \$125 million annually. An estimated welfare of around \$50 million is contributed by Bonaire’s nature to tourism. Stay-over tourists are found to contribute more to the tourism industry than cruise tourists, and marine ecosystems are found to be more economically significant than terrestrial ecosystems on the island. The high WTP of tourists for additional nature protection in Bonaire provides opportunities for the local government to increase the current user fees of visitors to Bonaire.

## The Challenge

In the current era of financial insecurity and environmental degradation it becomes clear that classical investments in a strong economy are not always contributing to a healthy environment. In reaction, a growing minority is working to show that the two are strongly interlinked, and that in fact a healthy environment is critical to human as well as financial wellbeing, especially in the longer run. The challenge is to find methods to accurately measure and value these ecosystem services. This study deals with the socio-economic value of Tourism as a service of Bonaire's coral reefs. Bonairean ecosystems provide many touristic activities that depend on the quality of the natural environment, including diving, snorkelling, kayaking, boating, enjoying beaches, and participating in land activities, including mountain biking, hiking and bird watching. It is therefore that the natural environment of Bonaire is an important attraction for visitors.

Tourism is an industry with substantial size and financial significance to the economy of Bonaire. The island is home to approximately 16,000 residents, and roughly 70,000 tourists visit the island by airplane and around the

200,000 tourists by cruise ship annually. Further development of the tourism industry requires that investments are made to create proper infrastructure and sufficient facilities for visitors. Meanwhile, an increase in the number of tourists and investments in infrastructure put extra pressure on the very same ecosystems that attract the tourists.

It is essential that the economic value of the tourism industry and its dependence on Bonairean ecosystems is determined in order to further assist policy-makers in understanding this crucial paradoxical relationship.

The coral reefs of Bonaire attract divers and snorkelers seeking to interact with some of the most quickly declining ecosystems on the globe. Furthermore, Bonaire's mangrove forests invite kayakers and boaters to the remote island, while its pristine beaches and beautiful coastline appeal to more relaxed travellers. The quality of Bonaire's coral reefs have been in decline in recent years. The number of visitors to the island interacting with this precious ecosystem contributes to an increased pressure to this already fragile reef. Protect the environment while securing the wellbeing of the islands economy is a crucial challenge for Bonaire.

*The tourism industry and its dependence and impact on Bonairean ecosystems is a crucial paradoxical relationship.*





## The Approach

'Ecosystem services' is a fairly new concept which is defined as "the benefits that people obtain from ecosystems" (MEA, 2005). The goal of this study is to estimate the value of the ecosystem services provided by nature to the tourism industry and to find out whether tourists are willing to financially support conservation efforts of nature on Bonaire.

This study identifies the activities in which tourists participate while visiting Bonaire, and quantifies the economic activity that is created through these activities, in order to determine the value of Bonairean ecosystems for the tourism industry. A tourist exit survey has been conducted to estimate the dependence on healthy ecosystems. The study then uses spatial data to determine which ecosystems have the highest economic value with regards to tourism.

The tourist exit survey is used to investigate the expenditures of tourists visiting Bonaire, as well as their willingness to pay (WTP) for protection of Bonairean nature. This elucidates tourists' perceived value of different aspects of Bonairean nature. To gain more insight into the development and composition of the tourism industry on the island, two distinct types of tourists who visit the island have been interviewed: stay-over tourists who arrive mostly by airplane, and cruise tourists who arrive by cruise ship and spend significantly less time on the island. Using a novel valuation approach, the study estimates the impact of Bonairean nature on the Consumer Surplus (CS) of the tourist industry. Revenue is estimated through the responses about tourist expenses that the survey administered. In the study, an annual value for the value of nature for the tourist industry is calculated. Moreover, a wide range of qualitative insights has been generated.



## Country Overview.

Bonaire is a Caribbean island of approximately 288 km<sup>2</sup>, with circa 16,000 permanent inhabitants. Bonaire is a 'special municipality' of the Netherlands. The entire coastline of the island is designated as a marine sanctuary in an effort to protect what are considered to be some of the most pristine coral reefs in the Caribbean. Tourism accounts for the majority of economic activity on the island and fishery hold significant economic and cultural influence. Much of Bonaire's economy and many of its residents rely on the quality of the island's ecosystems. Bonaire currently has two protected natural areas: the Bonaire National Marine Park (BNMP) set up in 1979 and the Washington Slagbaai National Park (WSNP) set up in 1969. The national marine protected areas include five Ramsar areas - Lac, Gotomeer, Pekelmeer, Slagbaai and Klein Bonaire.

## Results

The study estimates that the tourists spend approximately \$125 million annually on Bonaire. Of this amount, \$100 million is contributed by stay-over tourists, whose visits are found to strongly correlate with the quality of nature. Moreover, as opposed to cruise ship tourists who visit multiple islands during their vacation, stay-over tourists visit Bonaire only and are also much more likely to return to the island. In fact, more than 50% of the stay-over tourists are likely to return to Bonaire. Almost 40% of the returning visitors will not return anymore when Bonaire has 50% more buildings and is more crowded than it is today. More than 40% will not return when the reefs severely deteriorate (see Figure 1).

There is no significant conversion of cruise tourists into stay-over tourists or vice-versa. This emphasizes the importance of stay-over tourists for the tourism industry. The study estimates that a welfare contribution of around \$50 million is dependent on the nature of Bonaire. This supports the hypothesis that nature is a crucial factor for the islands tourism, especially the marine ecosystems. Another insight derived is that the marine ecosystems are significantly more valuable to tourism than terrestrial environments (as shown in Figure 2).

Figure 1

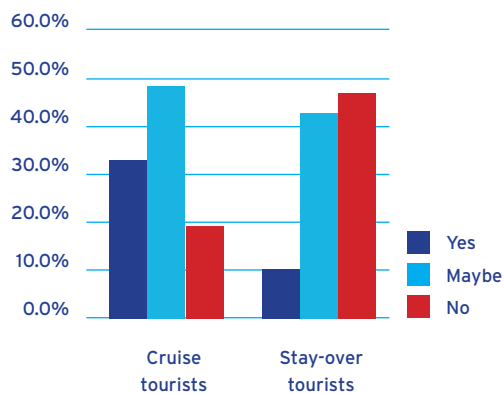


Figure 1:  
Result of the question whether the tourists would return with significantly degraded coral reefs

Figure 2

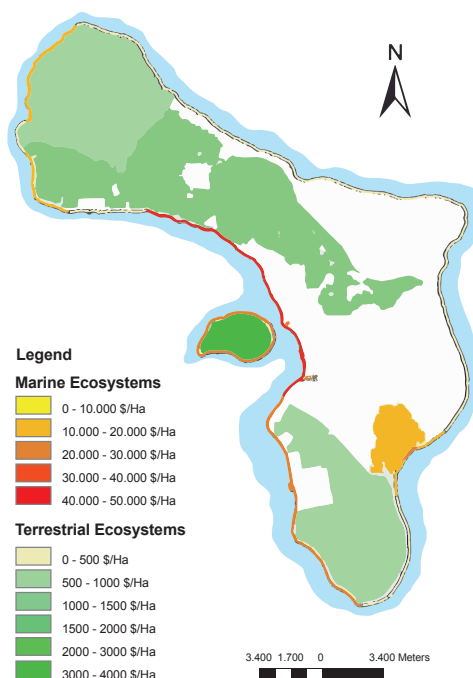


Figure 2:  
The marine ecosystems are significantly more valuable to tourism than terrestrial environments



## Recommendations

The study discovered that the tourists' consumer surplus is not optimally exploited by Bonaire: tourists are willing to pay much more to preserve the nature on the island than they currently do. This suggests that the fees for using the nature on the island could be increased without negatively affecting the visitation rate in Bonaire. Policy makers on Bonaire give much emphasis to expand cruise ship tourism with the assumption that these visitors will return to the island as well paying stay-over tourists. The study has shown that this re-visitation hardly occurs. Therefore, policy should focus more on improving the experience of stay-over tourists as these visitors are more likely to revisit the island. Moreover, stay-over tourists often act as ambassadors of Bonaire and therefore may encourage new visitors to come to the island.

Finally, policy makers and the tourism industry suffer a lot from lack of good information to base their strategies on. It is therefore recommended to develop a better insight into trends in visitation, motivations and experiences of the visitors. After all, the tourists that visit Bonaire are the engine of the island economy and therefore provide an important reason to preserve the fragile nature of Bonaire.

### Further Information

For further information about valuing Ecosystem Services on the island of Bonaire, contact Esther Wolfs ([esther@wkics.com](mailto:esther@wkics.com)) or Pieter van Beukering at IVM ([pieter.van.beukering@vu.nl](mailto:pieter.van.beukering@vu.nl)) and the webpage [www.ivm.vu.nl/en/projects/Projects/economics/Bonaire](http://www.ivm.vu.nl/en/projects/Projects/economics/Bonaire)

### References

Schep S, Brander L, Van Beukering, Wolfs E,(2012) The touristic value of nature on Bonaire. A multiple valuation techniques approach, in assignment of the Ministry of Economic Affairs the Netherlands

# Tourists are willing to pay much more to conserve the nature of Bonaire

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