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## WHAT'S BONAIRE'S NATURE WORTH? 2011-2012

### **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 very interlinked, and that in fact a healthy environment is critical to human as well as financial wellbeing, especially in the longer run. In order to make well-founded decisions when managing these ecosystem services, it is necessary to determine all benefits that are derived from the ecosystems and their importance to society. The challenge is to find methods to accurately measure and value these ecosystem services subject to a 'tragedy of the commons' scenario: public spaces, access to waters and parks, healthy ecosystems, etc.

Bonaire's unique environment, the beautiful reefs and unique species are situated in the Netherlands. The coastal waters contain coral reefs, mangroves and sea grass systems, and on land the island is characterized by dry forest and farmland (Kunuku's). Bonaire inhabitants lived in balance with nature all their lives. However many pressures including a fast economic development of the island lead to less resilient ecosystems causing the people of Bonaire to take more precaution than they are used to. Therefore it is very important to understand how nature contributes to Bonaire's economy and human wellbeing. There is a need for sound scientific and user information to guide decision making regarding the protection and management of the fragile ecosystems.

## Country Overview

Bonaire is a Caribbean island of approximately 288 km<sup>2</sup>, with approximately 16,000 permanent inhabitants. Bonaire is a public entity 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 world. Tourism accounts for the majority of economic activity on the islands and fisheries hold significant economic and cultural influence. Because 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.



[Natural Treasures of Bonaire](http://www.youtube.com/watch?v=zEiPFO8kWKc) (<http://www.youtube.com/watch?v=zEiPFO8kWKc>) from [Alalena Mediaproducties](http://www.vimeo.com/user4994886) (<http://vimeo.com/user4994886>) on YouTube.

For all movies on the Bonaire project see: [Bonaire movies](/en/research-new/environmental-economics/projects/Bonaire/Films_Bonaire.aspx) (/en/research-new/environmental-economics/projects/Bonaire/Films\_Bonaire.aspx).

### The Approach:

'Ecosystem services' is a fairly new term, and represents the socio-economical unvalued services ecosystems provide to humans, recreation, cultural significance, or simply aesthetic pleasure. Most

ecosystems are either public or quasi-public goods: there are no specific property rights assigned and/or people cannot be excluded from using them. Such situations are often labelled 'a tragedy of the commons,' because misuse and degradation often occurs.

By assigning these ecosystem services a value, however, environmental economists hope to highlight the willingness of individuals to pay for their protection, as well as mechanisms (e.g. like a tax) to do so. One way to define its values is by figuring out communities' "Willingness-to-Pay" (WTP) to maintain their public spaces. For example how much would I, as an individual, be willing to pay to preserve nature near my home? How much would I be willing to pay to improve the coral reefs on an island I visit, even if I don't go fishing or swimming near them?



*With courtesy: Pieter van Baren - Wasingthon Slagbaai NP*

This Initiative draws attention to the economic benefits of biodiversity and highlights the growing costs of biodiversity loss and ecosystem degradation. Insight in the value of ecosystems and biodiversity can support decision makers to make wise and inclusive decisions for long-term sustainable economic development.

Information on the Total Economic Value (TEV) of Bonaire's nature is used to build a strategy to advocate for the effective conservation measures on Bonaire. The TEV is the sum of the ecosystem services provided by the marine and terrestrial ecosystems of Bonaire. In total, more than 10 different

services have been valued on monetary terms. The most relevant services that were estimated in extensive sub-studies include the following:

- [Local cultural and recreational values](/en/research-new/environmental-economics/projects/Bonaire/local_values/index.aspx) (/en/research-new/environmental-economics/projects/Bonaire/local\_values/index.aspx)
- [International tourism value](/en/research-new/environmental-economics/projects/Bonaire/tourism_value/index.aspx) (/en/research-new/environmental-economics/projects/Bonaire/tourism\_value/index.aspx)
- [Fisheries values](/en/research-new/environmental-economics/projects/Bonaire/fisheries_values/index.aspx) (/en/research-new/environmental-economics/projects/Bonaire/fisheries\_values/index.aspx)
- [Non-use value](/en/research-new/environmental-economics/projects/Bonaire/non_use_value/index.aspx) (/en/research-new/environmental-economics/projects/Bonaire/non\_use\_value/index.aspx)
- [Coastal protection value](/en/research-new/environmental-economics/projects/Bonaire/coastal_protection/index.aspx) (/en/research-new/environmental-economics/projects/Bonaire/coastal\_protection/index.aspx)
- [Functional Valuation of Ecosystem Services on Bonaire](/en/research-new/environmental-economics/projects/Bonaire/fundtional_valuation/index.aspx) (/en/research-new/environmental-economics/projects/Bonaire/fundtional\_valuation/index.aspx)

Through the use of simulation models, scenario development and cost & benefit analysis the efficacy of various interventions is determined. Cost-benefit analysis of different scenarios provides an objective means of deciding which interventions produces the highest yield. Such an integral approach ultimately ensures the betterment of Bonaire's environment while at the same time warranting sustainable economic development.

### **Results & Recommendations:**

The TEV of nature of Bonaire amounts to more than US\$100 million annually. These values vary significantly between ecosystem services: tourism (\$50 million), local recreation and cultural values (\$3.9 million), support to fisheries (\$1.1 million), research and educational services (\$1.4 million), coastal protection (\$0.1 million), and most importantly the non-use values enjoyed by people in the Netherlands (\$15.5 million per month = 12 M euro per month of 17 M euro per maand is X M USD per jaar).





*With courtesy: Zsuzsanna Pusztai*

Out of the extensive analysis of the ecosystem services and the different scenarios one thing is obvious i.e. an ounce of prevention is worth a pound of cure. In other words, it is more efficient to prevent extensive environmental damage than trying to revitalize the environment while there are still threats at hand. A scenario that was aimed at the abatement of invasive species also proved very cost effective. By removing the threat of goats and Lionfish, the environment has the possibility to regenerate. This demonstrates that interventions and policies need to be aimed at preventing damage to Bonaire's nature.

#### **Policy briefs:**

- [What's Bonaire's Nature Worth?](/en/Images/2001_TEEB_Bonaire_total_tcm234-310328.pdf) (/en/Images/2001\_TEEB\_Bonaire\_total\_tcm234-310328.pdf)
- [Local Cultural and Recreational Values](/en/Images/2001_TEEB_Cultural-brief_O_08_tcm234-309201.pdf) (/en/Images/2001\_TEEB\_Cultural-brief\_O\_08\_tcm234-309201.pdf)
- [International Tourism Value](/en/Images/2001_TEEB_Tourism-brief_O_09_tcm234-309207.pdf) (/en/Images/2001\_TEEB\_Tourism-brief\_O\_09\_tcm234-309207.pdf)
- [Fisheries Values](/en/Images/2001_TEEB_Fishing-brief_O_09_tcm234-309202.pdf) (/en/Images/2001\_TEEB\_Fishing-brief\_O\_09\_tcm234-309202.pdf)
- [Non-use Value](/en/Images/2001_TEEB_Non-Use_brief_O_07_tcm234-309209.pdf) (/en/Images/2001\_TEEB\_Non-Use\_brief\_O\_07\_tcm234-309209.pdf)
- Coastal Protection Value
- Functional Valuation of Ecosystem Services on Bonaire

#### [Letter State Secretary Economic Affairs](/en/Images/Brief_staatssecretaris_ter_aanbieding_van_de_resultaten_van_The_Economic____tcm234-322271.pdf)

(/en/Images/Brief\_staatssecretaris\_ter\_aanbieding\_van\_de\_resultaten\_van\_The\_Economic\_\_\_\_tcm234-322271.pdf) on **Bonaire project results** (in Dutch).

#### **Reports:**

- [Local Cultural and Recreational Values](/en/Images/R12-10_Main_Report_-_Local_culture_and_recreation_tcm234-320351.pdf) (/en/Images/R12-10\_Main\_Report\_-\_Local\_culture\_and\_recreation\_tcm234-320351.pdf)

- [International Tourism Value](/en/Images/R13-02_Main_Report_-_Tourism_Value_Bonaire_tcm234-320356.pdf) (/en/Images/R13-02\_Main\_Report\_-\_Tourism\_Value\_Bonaire\_tcm234-320356.pdf)
- [Fisheries Values](/en/Images/R12-08_Main_report_-_fisheries_value_Bonaire_tcm234-320350.pdf) (/en/Images/R12-08\_Main\_report\_-\_fisheries\_value\_Bonaire\_tcm234-320350.pdf)
- [Non-use Value](/en/Images/R12-07_Main_report_non_use_value_BES_Islands__final_version__tcm234-332859.pdf) (/en/Images/R12-07\_Main\_report\_non\_use\_value\_BES\_Islands\_\_final\_version\_\_tcm234-332859.pdf)
- [Coastal Protection Value](/en/Images/R12-11_Main_report_-_Coastal_protection_value_Bonaire_tcm234-320354.pdf) (/en/Images/R12-11\_Main\_report\_-\_Coastal\_protection\_value\_Bonaire\_tcm234-320354.pdf)
- [Other Social and Economic Values](/en/Images/W12-14_Main_report_-_Other_values_BES_Islands_tcm234-320359.pdf) (/en/Images/W12-14\_Main\_report\_-\_Other\_values\_BES\_Islands\_tcm234-320359.pdf)
- [Functional Valuation of Ecosystem Services on Bonaire](/en/Images/Report_Functional_Valuation_Bonaire_IMARES_lvB_2012-05-18_tcm234-321519.pdf) (/en/Images/Report\_Functional\_Valuation\_Bonaire\_IMARES\_lvB\_2012-05-18\_tcm234-321519.pdf)
- [Total Economic Value of Nature on Bonaire](/en/Images/R13-01_Total_Economic_Value_of__Nature_of_Bonaire_%28Final_Version%29_tcm234-323751.pdf) (/en/Images/R13-01\_Total\_Economic\_Value\_of\_\_Nature\_of\_Bonaire\_%28Final\_Version%29\_tcm234-323751.pdf)

### Presentations:

- [Presentation Bonaire at EZ, Friday 30 November 2012](/en/Images/Seminar_30_november_2012_-_Pieter_van_Beukering_tcm234-310800.pdf) (/en/Images/Seminar\_30\_november\_2012\_-\_Pieter\_van\_Beukering\_tcm234-310800.pdf)(in Dutch)

### Citations research in media & papers:

- [Wat is de natuur op Saba en Statia waard? In Change Magazine](http://www.changemagazine.nl/klimaatkennis/biodiversiteit/wat-is-de-natuur-op-statia-en-saba-waard) (<http://www.changemagazine.nl/klimaatkennis/biodiversiteit/wat-is-de-natuur-op-statia-en-saba-waard>)

### Consortium:

- IVM: [www.ivm.vu.nl/](http://www.ivm.vu.nl/) (<http://www.ivm.vu.nl/>)
- IMARES: <http://www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/imares.htm> (<http://www.wageningenur.nl/nl/Expertises-Dienstverlening/Onderzoeksinstituten/imares.htm>)
- WKICS: <http://www.wkics.com/> (<http://www.wkics.com/>)
- Marine Positive: <http://marinepositive.com/> (<http://marinepositive.com/>)
- Ministry of Economic Affairs (EZ; funding), The Netherlands: <http://www.government.nl/ministries/ez> (<http://www.government.nl/ministries/ez>)

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