

# From Reef to Rooftop

*Nature-Inclusive Strategies for a Sustainable **Bonaire***



In collaboration with:

Stichting WeConnect  
and

The Ministry of Agriculture, Fisheries, Food Security and Nature (LVVN)

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## Preface

The Nature and Environment Policy Plan serves as the central policy framework for nature management on the islands of Bonaire, Saba, and Sint Eustatius. This plan outlines specific goals, which the islands themselves translate into action through their own implementation agendas. Each island faces unique challenges and operates within a distinct context. However, one key element that can be strengthened across all three is the active involvement of the local population, which plays a vital role in the success of the policy plan.

In 2024, the Ministry of Agriculture, Fisheries, Food Security and Nature (LNVN), in collaboration with Stichting WeConnect, transformed this ambition into a concrete policy question: **How can the islands take the lead in nature conservation through nature inclusivity?**

address this, an action-oriented think tank—or *doetank*—was formed in partnership with Stichting WeConnect. This group consisted of Caribbean students and young professionals with academic backgrounds in biology, marine biology, ecology, nature conservation, and related fields. Over the course of a year, and alongside their studies and professional responsibilities, the group worked on this policy challenge. Drawing from both their subject-matter expertise and their deep understanding of the local context, they provided fresh and valuable insights.

They worked on an answer to the following questions:

*"How can the islands take the lead in nature conservation through nature inclusivity?"*

1. How can nature inclusivity stimulate the sustainable development of society?
2. How can different stakeholders be involved, including local residents, entrepreneurs, and international investors?
3. How can the LNVN nature policy be communicated effectively on the islands to ensure community involvement and foster community-building?

Like the islands themselves, the recommendations developed by the *doetank* are tailored and island-specific. They reflect the unique opportunities and challenges of each island and aim to promote a more inclusive approach to nature conservation in the Caribbean Netherlands.

This initiative would not have been possible without the valuable contributions of the many stakeholders who guided the *doetank* with their expertise and insights.

## Introduction

Public engagement is essential to addressing social and environmental challenges (Reid et al., 2010). Researchers have emphasized that public attitudes and active participation play a vital role in effective environmental changes and sustainable decision-making (Anderson et al., 2021; Blake, 1999; Reed, 2008). Hence, a gap between the public and the government can reduce the effectiveness of initiatives to address environmental challenges. Therefore, it is important to include the public and stakeholders in order to successfully address and solve societal and environmental challenges (Anderson et al., 2021; Raymond et al., 2021; Reed, 2008). Community involvement contributes not only to the implementation of the project, but also to increasing public knowledge, which in turn leads to more sustainable and long-term solutions. For example, a study by Raymond et al. (2021) found that over 75% of participants improved their understanding of environmental sustainability and felt more confident in their ability to enhance their local environment after engaging in nature-based solutions (NbS) activities.

Additionally, public participation allows for the incorporation of local knowledge into conservation strategies, which enhances the effectiveness of NbS (Frantzeskaki, 2021; Sterling et al., 2017). Engaging local stakeholders and citizens in the development and maintenance of NbS projects can strengthen social cohesion and trust between stakeholders, furthermore, it may even increase support and successful implementation of the project (Sterling et al., 2017). Bridging the gap between the government, stakeholders, and the public enables the implementation of more creative, innovative, and long-lasting NbS that benefit both the community and the planet.

Caribbean islands face different types of environmental challenges. This project will begin by identifying the specific environmental challenges that occur on Bonaire, Saba and St. Eustatius that could be solved through NbS. To identify these challenges, both interviews and a literature review will be carried out. Using this information, further literature research will be conducted to develop detailed and tailored advice specifically designed for each island.

## Bonaire

The island of Bonaire, well known for its pristine coral reefs, terrestrial landscapes and rich cultural heritage. While its marine park is a cornerstone of its ecological value and identity, these unique ecosystems face pressures that threaten their long-term viability. The biggest challenges the island is currently facing are the free-roaming grazers and poor wastewater management. Goats were first introduced to the island in the 17<sup>th</sup> century, these introduced inhabitants have since caused direct and indirect changes on the marine and terrestrial ecosystem, significantly impacting the environmental health of the island. Grazers often feed on young plants, stopping local plant populations from spreading or reproducing. Overgrazing eventually leads to increased soil erosion and a decrease of water retention on the island, with eroded sediment subsequently flowing into the nearshore marine environment (Stinapa Bonaire, 2022). The island's water also faces problems with eutrophication (accumulation of nutrients), this can ultimately affect the biodiversity and coral reef health. The excess nutrients are caused by various sources, of which enriched groundwater outflow from land to reef is considered the biggest source. Groundwater is often enriched with nutrients due to the leaking septic tanks and poor wastewater infrastructure (Slijkerman et al., 2012).

Like other Dutch Caribbean islands, Bonaire faces escalating environmental pressures that threaten its natural heritage. But by ultimately tackling these problems the island can move towards a more long-term nature-inclusive and sustainable future.

### How can nature inclusivity stimulate the sustainable development of society?

Nature-inclusivity on Bonaire is essential for a liveable, future-proof society where people and nature coexist in balance. The island presents unique opportunities to intertwine natural systems with spatial development, including water management, green buffers, and the preservation of native vegetation. By smartly applying these systems, societal functions such as housing, recreation, and climate adaptation can be combined sustainably. This requires decisions that go beyond individual plots: integrating natural processes into the design of neighbourhoods, infrastructure, and tourism zones generates collective benefits such as cooling, water retention, and habitat for species.

The **Nature and Environmental Policy Plan Caribbean Netherlands (2020-2030)** emphasizes the importance of an integrated approach in which **nature-inclusivity** plays a central role. For Bonaire, clear priorities have been set, including controlling roaming grazers and improving wastewater management. These two challenges pose a direct threat to soil and water quality, coral reefs, and biodiversity — natural resources that the local economy strongly depends on. By actively managing grazers like goats and donkeys and integrating ecological barriers into design and management, erosion and overgrazing can be limited. At the same time, a nature-inclusive approach to wastewater — for example through vegetative filter systems or water reuse — offers opportunities for circular applications that enhance the island's **resilience**.

The Public Entity Bonaire (OLB) holds a leading responsibility in this. In cooperation with citizens, schools, designers, and policymakers, they can create learning environments where nature-inclusive thinking becomes the norm. **Education** plays a key role in this. By actively involving youth through schools, neighbourhood initiatives, and after-school programs in nature management and design, a generation grows up familiar with ecological values and equipped with practical skills to make sustainable choices.

When policy goals, design principles, and education work hand in hand, a **coherent approach** emerges in which the protection and restoration of natural systems are no longer seen as costs but as investments in sustainable societal development — socially, ecologically, and economically.

### How can different stakeholders be involved, including local residents, entrepreneurs, and international investors?

#### **Local residents:**

- Active participation in livestock management and monitoring of biofilters through neighborhood organizations.
- Engagement through education and offering compensations to increase motivation.

#### **Entrepreneurs:**

- Encouraging sustainable business solutions and circular systems.
- Involvement in decision-making about tourist levies that contribute to nature-inclusivity.

#### **International investors:**

- Provision of transparent reports on the impact of their investments.
- Attraction through strengthening Bonaire's sustainable image and international visibility.

An effective way to actively involve residents of Bonaire in nature-inclusive projects is through **small-scale initiatives** that deliver direct benefits for both people and nature. Examples include community management of roaming grazers such as goats and donkeys, which cause erosion and thereby threaten coral reefs. By housing these animals in fenced areas — for instance combined with small-scale livestock farming or shelters — nature is protected while simultaneously creating economic added value for residents (Van der Geest & Slijkerman, 2019). Crucial to this is that project design aligns with local values through participation, clear communication, and shared ownership (Ferreira et al., 2020). Entrepreneurs can also contribute through logistics or tourism, while international parties can invest in sustainable land restoration.

Another example is nature-inclusive **wastewater management** via biofilters or constructed wetlands. Many homes and businesses discharge insufficiently treated wastewater, leading to nutrient pollution of groundwater and sea — causing coral bleaching. Plant filters are a natural, low-maintenance solution that can be easily connected to existing septic tanks. This keeps costs low and allows residents to be involved in installation and maintenance at the neighbourhood level (Van den Bulk et al., 2022). Hotels or restaurants can invest in filter systems themselves, while larger systems can be financed through climate funds or NGOs (Pieper, 2023).

Finally, **increasing or expanding the tourist tax** can contribute to structural financing of environmental management. Transparency is essential here: tourists, entrepreneurs, and residents must be able to see where their contributions go — for example through visual campaigns at airports or on social media. This increases support and ensures that environmental policy is seen not as a cost but as a shared interest (Frenken, 2023; Briones et al., 2011). Thus, a sustainable financing structure arises in which residents benefit from a healthier living environment, entrepreneurs from stable cooperation, and investors from social impact.

### How can the LVVN nature policy be communicated effectively on the islands to ensure community involvement and foster community-building?

To effectively integrate the LVVN nature policy into Bonaire's society, an annual program has been developed that focuses on **awareness, participation, and local co-creation**. The program starts in January and gradually builds public support and engagement, with each month dedicated to a specific theme and approach that resonates with the daily lives of Bonairians. The aim is not only to transfer policy knowledge but, more importantly, to foster a sense of **shared ownership** and **connection to nature**.

#### **Annual Calendar: Events & Workshops on Nature-Inclusive Solution.**

The calendar on **page #8** outlines the planned activities aimed at promoting nature-inclusive solutions and engaging relevant stakeholders. Activities are spread across the year and range from inspirational and recreational gatherings to educational workshops and networking days.

## Conclusion and Recommendations

Bonaire can take the lead in nature conservation by treating **nature-inclusivity not as an afterthought, but as a foundation** for sustainable development. By actively integrating natural systems—such as water cycles, soil structure, and native vegetation—into policy, spatial planning, and education, a society can emerge in which **ecology and economy reinforce one another**. Addressing urgent environmental issues such as roaming grazers and polluted wastewater requires a **cohesive approach** in which residents, businesses, and government work together toward solutions. By linking **education, community participation, and culture** to environmental policy, Bonaire can develop into a model region where nature and community go hand in hand.

### Spatial Planning and Infrastructure.

Integrate nature into the redevelopment of neighbourhoods in Rincon and Playa by using native vegetation such as dividivi, which provides shade, cooling, and water infiltration. Construct roads with green buffers that capture rainwater, and design buildings with natural ventilation and shaded zones. *Example:* Install ecological barriers around vulnerable natural areas to keep out roaming grazers and involve local residents in their monitoring and upkeep.

### Water and Soil Management

Invest in small-scale, nature-based solutions for capturing and filtering rain- and wastewater, for instance through the installation of vegetative filters in villages lacking sewer systems. Promote composting and restoration of local soils, especially on dried-out or eroded lands. *Example:* Use wetland plants near village wells or drainage paths to naturally purify greywater and reduce erosion.

### Living Environment and Education

Make nature-inclusivity visible and tangible in the daily lives of Bonairians. Encourage school projects such as vegetable gardens and “wildlife-friendly gardens” featuring local flora and fauna. Develop a local campaign that connects nature and culture through dance, food, or music. *Examples:* Host a nature barbecue in Rincon where stories about traditional plants are shared or organize a bike tour showcasing green yard initiatives across the island.

### Regulation and Financial Incentives

Embed nature-inclusive building principles in local regulations, and support residents in implementing them. This could include subsidies for rainwater harvesting systems and ensuring that permit procedures take ecological value into account. *Example:* Develop an incentive program for residents who transform their gardens into biodiverse oases with native plants, or who collect and store water on their property.

By starting small with recognizable, community-driven measures, space is created for a larger narrative: a Bonaire where **nature, culture, and community coexist in harmony**



	1e kwartaal	2e kwartaal	3e kwartaal	4e kwartaal
Probleemstellingen	<div>Gemeenschapsbeheer voor loslopende grazers (bijv. ezels en geiten)</div> <div>Natuurinclusief afvalwaterbeheer via biofilters of constructed wetlands</div>			
Einddoelen	<div>Het verminderen van de aantal loslopende geiten en ezels</div> <div>Natuurlijke beheer van afvalwater</div>			
Activiteit	<ul style="list-style-type: none"> <li><b>JANUARI</b> Kick-off &amp; Inspiratiesessie "Natuurinclusief 2030"</li> <li><b>FEBRUARI:</b> Workshop: "Natuurinclusief Bouwen &amp; Renoveren"</li> <li><b>MAART:</b> Excursie &amp; demo: "Natuur als bondgenoot in de landbouw"</li> </ul>	<ul style="list-style-type: none"> <li><b>APRIL:</b> Landschapslab: "Natuurinclusief landschapsonwerp"</li> <li><b>MEI:</b> Natuurwandeling &amp; dialoog: "De verhalen van het landschap"</li> <li><b>JUNI:</b> Stakeholderdag: "Samenwerken aan Natuurinclusiviteit"</li> </ul>	<ul style="list-style-type: none"> <li><b>JULI:</b> Zomerschallenge jeugd: "Bouw een diervriendelijke tuin met natuurlijke afvalwater beheer"</li> <li><b>AUGUSTUS:</b> Pop-up Natuurinclusief paviljoen</li> <li><b>SEPTEMBER:</b> Workshopreks: "Wat betekent natuurinclusiviteit voor mij?"</li> </ul>	<ul style="list-style-type: none"> <li><b>OCTOBER:</b> Masterclass: "Verdienmodellen voor natuur"</li> <li><b>NOVEMBER:</b> Landschapscaf��: "Resultaten, verhalen &amp; vervolg"</li> <li><b>DECEMBER:</b> Reflectie &amp; Strategiedag "Leren van 202x→ vooruit 202x"</li> </ul>
Vorm & Locatie	<ul style="list-style-type: none"> <li><b>JANUARI :</b> Plenaire bijeenkomte (Gemeentehuis)</li> <li><b>FEBRUARI:</b> Workshop (Buurthuis/Marshe)</li> <li><b>MAART:</b> Excursie naar projectgebied(en)</li> </ul>	<ul style="list-style-type: none"> <li><b>APRIL:</b> Design avond</li> <li><b>MEI:</b> Begeleide traject - Buiten activiteit</li> <li><b>JUNI:</b> Natuurbijeenkomst met panelgesprek</li> </ul>	<ul style="list-style-type: none"> <li><b>JULI:</b> Actieweek - gevuld met activiteiten en prijzen</li> <li><b>AUGUSTUS:</b> Pop up stand (Marshe)</li> <li><b>SEPTEMBER:</b> Kleinschalige groepsessies (Gemeentehuis)</li> </ul>	<ul style="list-style-type: none"> <li><b>OCTOBER:</b> Masterclass</li> <li><b>NOVEMBER:</b> Cafe-avond met presentaties</li> <li><b>DECEMBER:</b> Werksessies en Netwerkborel</li> </ul>
Doelgroepen	<div>Te betrekken (organisaties/groepen):</div> <ul style="list-style-type: none"> <li>Bonaire Hotel and Tourism Association</li> <li>Bonaire Youth Outreach Foundation</li> <li>Vrijwilligers Korps Bonaire</li> <li>Scholengemeenschap Bonaire</li> <li>Jong Bonaire</li> <li>Boeren</li> <li>Stichting Rotary club Bonaire</li> </ul> <div>Stakeholders:</div> <ul style="list-style-type: none"> <li>Awa pa Boneiru</li> <li>Dutch Caribbean Nature Alliance</li> <li>Stichting Donkey Sanctuary Bonaire</li> <li>Foundation animal welfare Bonaire</li> <li>Openbaar lichaam Bonaire</li> <li>Fundashon desaroyo Rincon</li> <li>Mi mes Hofito</li> </ul> <ul style="list-style-type: none"> <li>Water en Elektriciteit Bonaire</li> <li>Royal Haskoning DHV</li> <li>Landbouw, Veeteelt &amp; Visserij Bonaire</li> <li>STINAPA</li> <li>Krioyo Painting</li> <li>GreenSoil Caribbean</li> <li>GEF Small Grants Programme (SGP)</li> <li>Local2030 Islands Network</li> </ul>			