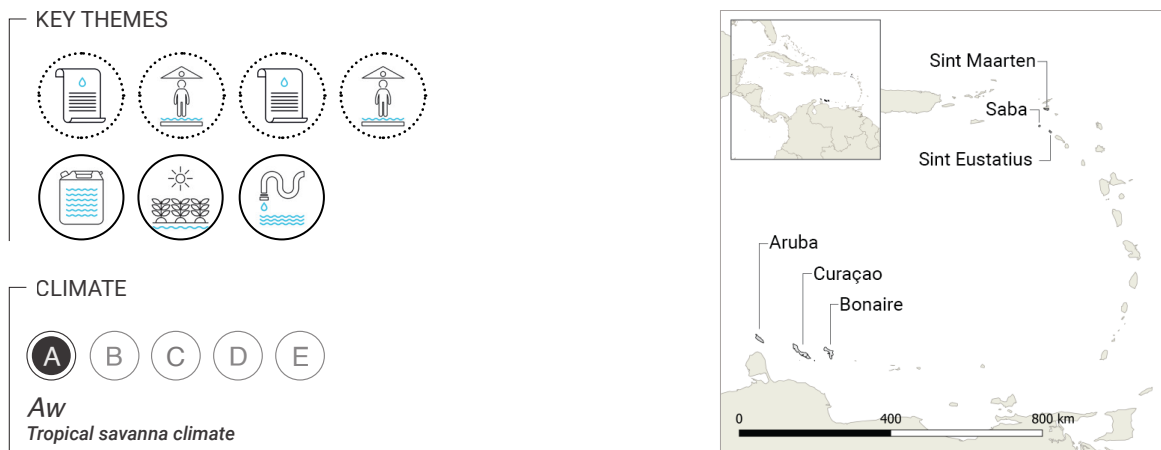




# Thirsty Islands and Water Inequality: The Impact of Colonial Practices on Freshwater Challenges in the Dutch Caribbean

Suzanne Loen  
 LILA Living Landscapes

*Small Island Developing States (SIDS) and Territories in the Dutch Caribbean face unique water challenges related to climate change. With fragile ecosystems and surrounded by rising sea levels and limited natural resources, island communities are increasingly faced with the reality of life with extreme drought and floods. While Caribbean SIDS in general have limited freshwater resources and limited water-retaining capacity due to natural characteristics, it is undeniable that unsustainable actions, practices and attitudes under colonial rule, such as deforestation and “property-thinking,” have contributed to present-day environmental degradation, freshwater resource management problems and water inequality. In the Netherlands, there are ongoing discussions about reparative justice compensation for the impact of Dutch colonial imperialism. In this light, it is worth considering whether reparative justice for the former colonial territories could take the form of eco- and heritage-system reparations and substantial investments in nature- and heritage-based solutions.*



< Fig. 1 An almost dry streambed of a *rooi* in Curaçao. The *rooien* are the hydrological and ecological backbone of the island. They only carry water after sufficient rainfall and are therefore easily overlooked and destroyed during spatial developments and land use change (Source: John Dohmen, 2017. CC BY-NC).

## **The Current State of Water**

The Dutch Caribbean Small Islands States (SIDS) and Territories are part of the Lesser Antilles, an island “arc” between Puerto Rico and Venezuela. Within the Kingdom of the Netherlands, Curaçao, Aruba and Sint-Maarten (CAS islands) are autonomous countries, while Bonaire, St. Eustatius and Saba (BES islands) are special municipalities. The impact of the climate crisis on these former colonial territories of the Netherlands involves increasingly extreme weather patterns and rising sea levels, felt directly and intensely. Located east of Puerto Rico, the islands of Saba, St. Maarten and St. Eustatius (S islands) are located within the hurricane belt. At the periphery of the hurricane belt, located off the coast of Venezuela, Aruba, Bonaire and Curaçao constitute the ABC islands group. While the islands show a variety of geographical and hydrological circumstances, their semi-arid climates are characterized by long periods of drought and spells of strong storms increasingly causing economic and social disruption and devastation. Because of the natural soil characteristics and topsoil degradation, with limited freshwater resources and water-retaining capacity, there is little room to store rainwater to alleviate water stress and prevent the natural environment from desiccation in periods of extreme drought. Drinking water in the Dutch Caribbean is generally produced from seawater through reverse osmosis, an energy-demanding process that drives up the price of water. Today, many Dutch Caribbean citizens depend on tourism for their livelihoods. Tourism is a water-intensive industry that puts an extra strain on natural resources and the insular freshwater supply (Heartsill-Scalley 2012).

## **The Climate Crisis and Water Inequality**

Freshwater systems in the Caribbean are in a

state of crisis (Heartsill-Scalley 2012), amplified by the impact of climate change. In the Netherlands, the Dutch government has put climate adaptation and mitigation firmly on the agenda. However, the impact of the climate crisis on the Dutch Caribbean is under-researched. Hence, policies and programs for the BES islands to respond to the climate crisis are lacking. The urgent need for the Dutch government to address this issue was underlined in a recent study, “The Impacts of Climate Change on Bonaire” (Koks et al. 2022), in which the researchers estimated that a fifth of the island of Bonaire will be permanently inundated by 2050. Mangrove decay, declining shorelines, floods and inundation will also amplify the strained insular freshwater supply due to salination. The price of drinking water on St. Eustatius is already seven times higher than in the Netherlands, a price which about half the island population cannot afford. Without access to piped water, people are forced to rely on private rainwater cisterns. Due to longer periods of drought and increasingly erratic rain patterns, these domestic systems do little to alleviate water insecurity. This is in stark contrast to the Netherlands where almost 100 per cent of households have access to piped water.

## **The Historical Exploitation of Natural Resources**

In general, small island ecosystems are more vulnerable to the impact of climate change and natural disasters than those on larger land masses. However, the negative impact of (over) exploitation of natural resources and land use changes during colonial rule have affected island ecology and freshwater recharge capacity. The Dutch colonial empire treated their foreign territories mainly as extraction colonies. In Curaçao, the Spanish and Dutch occupation marked the beginning and acceleration of large-scale deforestation (primarily for dyewood).



^ Fig. 2 Stone and earthen dams were built in the rooi-streambeds for water retention and to prevent water from running off to sea. (Source: John Dohmen, 2017. CC BY-NC).

The introduction of grazing cattle deterred the regrowth of green cover and led to the degradation of the topsoil. This negatively affected the water-retaining capacity of the soil, while the decreasing size of the mangrove belt led to an increase in salt intrusion in coastal freshwater sources. Freshwater scarcity however did not prevent water from becoming a commodity on commercially operated water plantations (*waterplantages*) of Curaçao (fig. 3) (Loen 2019). Here, water was extracted from the soil to sell, for example, to passing cargo ships. To increase the water yield, large dams were built downstream in the streambeds of *rooien* (ephemeral streams also known as guts, ghuts

or gullies) (fig. 1 and 2). This led to erosion, the silting of the soil and increased the risk of dam breaches. During the oil era (ca. 1920~1950), the Curaçao oil refinery industry took over many water plantations to extract water for their industrial processes, often at the expense of nature, agriculture, people and livestock.

### “Property-Thinking”

Throughout history, the scarcity of freshwater in what are now the Dutch Caribbean islands has been a source of conflict and tension – whether between Indigenous people and invading enti-



^ Fig. 3 Watermills on a water plantation in Curaçao, ca. 1900–1920 (Source: Collection Soubllette et Fils - Curaçao - Colección Dr. Johan Hartog /Biblioteca Nacional Aruba, 2020. Public domain, via Wikimedia Commons).

ties, rural and urban populations, landowners and enslaved people or commercial and public interests. “Property-thinking” – the transfer (or confiscation) of public goods, such as water and land, to colonial capitalist governing entities – was a cornerstone of the Dutch colonial empire. Informal (marginalized) stakeholders such as Indigenous and (formerly) enslaved islanders had no voice in the management of land, water or natural resources on which they depended for their livelihoods. According to Bhattacharyya (2019) colonial “property-thinking” resulted in the loss of social, cultural, economic, legal and spiritual ownership for Indigenous and marginalized communities and continues to shape our living environments often with devastating

ecological consequences. The large-scale deforestation as well as the way in which the government accommodated the transfer of water plantations to Curaçao’s oil industry and commodification of water without consideration for those who depended on the water and land for their livelihood are scenarios of “property-thinking.” The legacy of “property-thinking” in the postcolonial era is reflected in the backlog and shortcomings of public (water) infrastructure and services, planning policies and the extent of environmental degradation.

## **The Erasure of Traditional Culture and Knowledge Systems**

Dutch society is still coming to terms with the crimes committed against Indigenous people, enslaved people and their descendants under colonial rule. With the tragic erasure or (cultural) genocide of the Indigenous people and oppression of the enslaved came the loss of local traditional ecological knowledge systems (TEKS). Little is known about the traces and legacy of TEKS on material and immaterial (water) heritage, let alone their potential value to build resilience against the impact of the climate crisis. A study of freshwater management in St. Eustatius notes the existence of enslaved workers who specialized in rainwater harvesting and water management systems, of which no written records have been found (Van Keulen 2018). The subjugated and marginalized position of both Indigenous and Afro-Caribbean people has no doubt contributed to the lack of attention to and appreciation for traditional freshwater management systems.

## **Discussion: Ecological and Heritage Systems Reparations?**

To say Dutch Caribbean SIDS are facing water challenges is an understatement. Ecosystems, people and their livelihoods face the acute threat of a water crisis amplified by the impact of climate change. It is undeniable that past actions, practices and attitudes under corporate colonial rule, including the over-exploitation of natural resources and “property thinking,” have contributed to present-day environmental degradation, freshwater resource management problems and geographical water inequalities. Huge investments are needed to transform infrastructures and institutions to reduce inequality (SDG 9, 10, 16). However, to build sustain-

able settlements and improve access to clean water and sanitation (SDG 6, 11), innovation and optimization alone are not the answer. In order to tap into the potential of ecosystem services and holistic nature- and heritage-based solutions, it is essential to restore terrestrial and aquatic ecosystems (SDG 13, 14, 15).

On 19 December 2022, the Dutch prime minister offered formal apologies on behalf of the government to former colonies in the Caribbean for its involvement in the transatlantic slave trade. There have long been discussions about reparative justice through financial compensation for the former colonies and with the recent apologies by the minister, discussions have revived. In light of increasing climatic and water inequalities amplified by the climate crisis, it is worth considering whether reparative justice for the former colonial territories could take the form of eco- and heritage-system reparations and investments in nature- and heritage-based solutions.

## **Acknowledgment**

The Thirsty Island Curaçao research project was financially supported by the Creative Industries Fund NL. This contribution was peer-reviewed. It was edited by members of the editorial team of the UNESCO Chair Water, Ports and Historic Cities: Carola Hein and Carlien Donkor.

## References

Bhattacharyya, Debjani. 2019. *Empire and Ecology in the Bengal Delta the Making of Calcutta*. Cambridge: Cambridge University Press. <https://www.vlebooks.com/vleweb/product/openreader?id=none&isbn=9781108348867>.

Koks, Elco, Maarten de Boer, Lotte van Oosterhout and Sophie Buijs. 2022. *The Vulnerable Future of Bonaire: A Direct Climate Damage Assessment of the Built Environment of Bonaire*. Report, IVM Institute for Environmental Studies. [https://assets.vu.nl/d8b6f1f5-816c-005b-1dc1-e363dd7ce9a5/5d7c0d51-a435-4bc9-8b77-a64e618be502/IVM\\_R22-08\\_Infrastructure.pdf](https://assets.vu.nl/d8b6f1f5-816c-005b-1dc1-e363dd7ce9a5/5d7c0d51-a435-4bc9-8b77-a64e618be502/IVM_R22-08_Infrastructure.pdf).

Loen, Suzanne. 2021. "Thirsty Cities: Shared Water Heritage in the Small Island States of the Dutch Caribbean." In *LDE Heritage Conference on Heritage and the Sustainable Development Goals: Proceedings*, edited by U. Pottgiesser, S. Fatoric, C. Hein, E. de Maaker and A. Pereira Roders, 370–96. Delft: TU Delft.

Heartsill-Scalley, Tamara. 2012. "Freshwater Resources in the Insular Caribbean: An Environmental Perspective." *Caribbean Studies* 40, no. 2: 63–93. <https://doi.org/10.1353/crb.2012.0030>.

Van Keulen, Fred. 2018. "The Island without Water: The Cisterns of St. Eustatius in the Colonial Era." Master's thesis, Leiden University. <https://studenttheses.universiteitleiden.nl/handle/1887/59549>.

© Author(s) 2023. This work is distributed under a Creative Commons Attribution 4.0 license (unless otherwise indicated). This license allows anyone to redistribute, mix and adapt, as long as credit is given to the authors.



**Suzanne Loen**, founder of LILA Living Landscapes, is a landscape researcher and architect with a focus and expertise on historical landscapes, water systems and climate adaptation. Taking a nature- and heritage-inclusive approach, she develops strategies for resilient and healthy cities and landscapes. She initiated the research project “Thirsty Cities/Thirsty Islands” to stimulate knowledge on water-sensitive spatial planning. Together with TU Delft, she initiated and developed the Visual Water Biography method within the KIEM-NWO funded research project “Circular Water Stories.” Suzanne teaches the minor in heritage and design in the division of landscape architecture at TU Delft and is co-author, with Inge Bobbink, of *Water InSight: A Landscape Architectonic Exploration of Polder Water*.

Contact: [suzanneloen@lilalandscape.nl](mailto:suzanneloen@lilalandscape.nl)