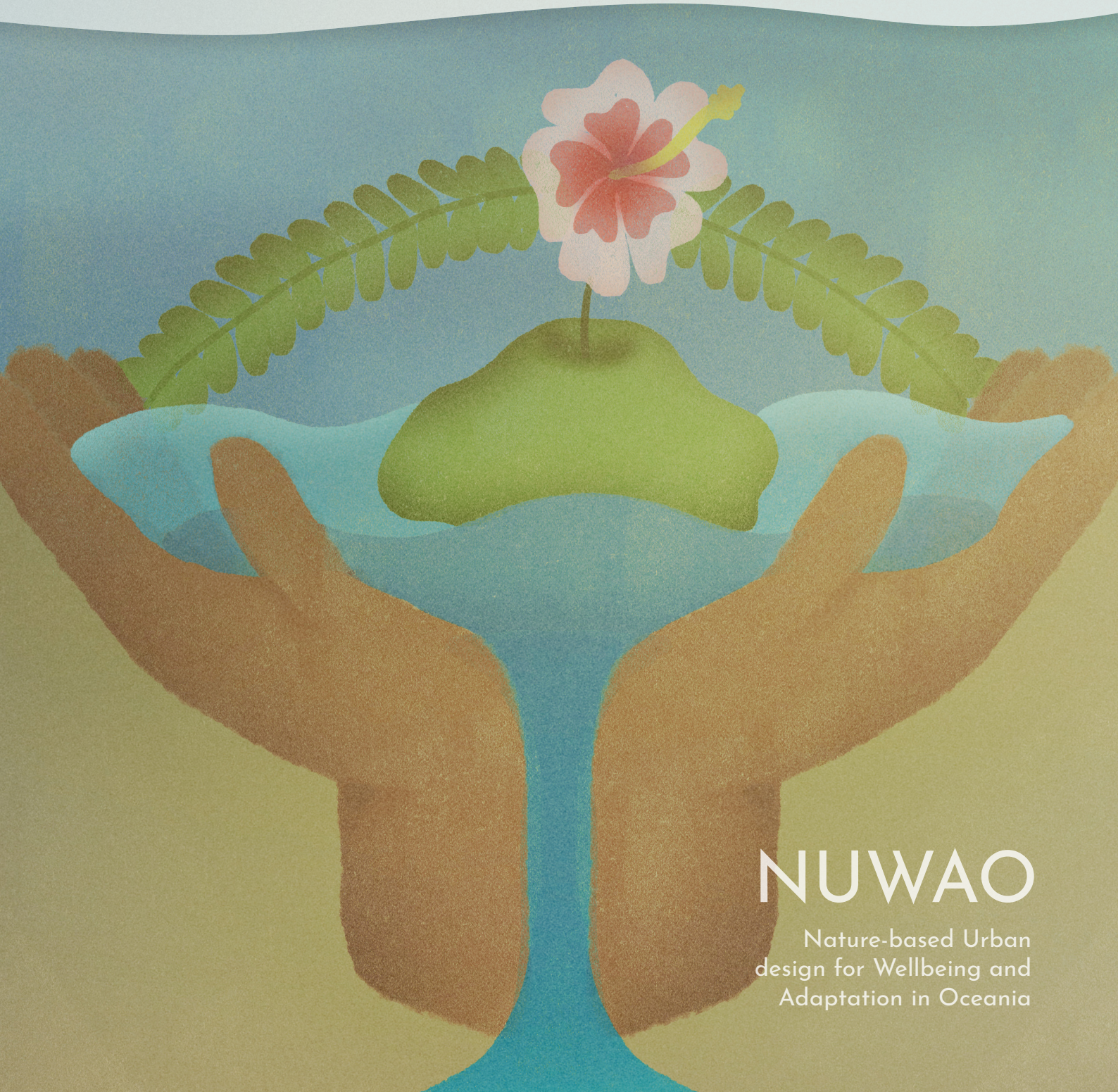


Nature-based Solutions Design Guide for Te Moananui Oceania



NUWAO

Nature-based Urban
design for Wellbeing and
Adaptation in Oceania

NUWAO Nature-based Solutions Design Guide for Te Moananui Oceania

We don't have land, we are the land
We don't have ocean, we are the ocean
We don't have relationship, we are relationship
Rooted, connected
Fixed yet fluid

Upolu Lumā Vaai (2017)

The NUWAO Nature-based Solutions Design Guide for Te Moananui Oceania is a tool for those involved in urban design, planning, policy-making, and community engagement, who aim to create urban spaces that work with nature to enhance the health and wellbeing of people, other living beings, and ecosystems. It features an accessible database of approximately 100 practical NbS strategies, offering guidance and inspiration for the design of NbS initiatives. The strategies range from internationally recognised to those unique to the Te Moananui Oceania region.

NbS can be searched for in five distinct ways based on: realms of influence related to a varying but common Te Moananui Oceania notion of interconnected living ecologies; climate change impacts addressed; societal benefits produced; the location of case studies; or by alphabetical order. This downloadable guide complements the online version (www.nuwao.org.nz), where additional information, supporting materials, and images for each NbS and related case studies are provided.

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Introduction

Nature-based solutions and climate change in Te Moananui Oceania

Nature-based solutions (NbS) are defined by the International Union for Conservation of Nature (IUCN) as “actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (Cohen-Shacham et al., 2019). More simply, NbS involve working with nature so that the wellbeing of both humans and non-human life and living systems are increased at the same time. NbS aim to enhance the resilience of ecosystems and increase the provision of ecosystem services (Kiddle et al., 2021a). NbS work with, rather than against nature and can lead to more effective and culturally rooted solutions to societal challenges through the regeneration of ecological systems across interconnected landscapes, ocean ecologies, and the human cultures embedded in them (Mihaere et al., 2024).

NbS are becoming more widely adopted around the world as a strategy to address climate change, the decline in biodiversity, and a wide range of challenges related to sustainable development. Te Moananui Oceania is gaining recognition as a frontrunner in applying NbS to climate change adaptation (Kiddle et al., 2021b), however, relationships to nature in the region are distinct from those of other global regions. This means working with nature and designing and implementing NbS has different meanings and potentials in Te Moananui Oceania (Mihaere et al., 2024).

Key barriers to the widespread implementation of NbS include a lack of expertise and knowledge and a lack of quantifiable evidence of performance and co-benefits (Linnerooth-Bayer et al. 2023). This guide aims to address these barriers within the setting of Te Moananui Oceania by highlighting particular NbS strategies and associating them with a range of co-benefits related to Indigenous perspectives on wellbeing in the region, their potential for climate adaptation, and their ability to help address societal issues. The guide illustrates the NbS strategies by providing a set of Te Moananui Oceania region-specific case studies illustrating and demonstrating the potential of each featured NbS. Each NbS highlighted in the guide is explored through its relationship to Indigenous knowledge, the particular ecosystem where it can be implemented as part of urban planning and design, and its technical requirements. Explanations of NbS strategies include links to images and further resources to provide evidence for claims made and to enable people to research individual NbS in more depth.

NbS, linked with traditional ecological knowledge (TEK) and local or Indigenous knowledges, provide critical opportunities to generate innovative adaptation responses to climate change in the diverse region of Te Moananui Oceania (Kiddle et al., 2021a; Nunn et al., 2024). Working closely with nature to create and design effective and resilient human settlements, while maintaining healthy ecosystems, has always been a cornerstone of traditional Te Moananui Oceania cultures. Indigenous knowledges have long held that human wellbeing is inextricably connected to ecosystem health, or that there is no nature-culture dualism (Harmsworth & Awatere, 2013). Building on Indigenous framings of wellbeing and partnering traditional knowledges with NbS leads to place-based, local, urban design responses that offer long-term benefits in diverse Te Moananui Oceania contexts (Kiddle et al., 2021b).

Despite evidence that climate change initiatives are more effective when they include Indigenous and local communities than when solely orchestrated by governments or private entities (World Bank, 2008), and despite cautions that NbS that overlook complex justice matters related to Indigenous knowledge, colonial histories, and land rights can be detrimental (Abbott et al., 2022), much of the literature on NbS omits discussion of Indigenous local knowledges and the involvement and safeguarding of local and Indigenous communities in NbS projects or strategies (Cottrell 2022).

To partly address these issues, and take into account the unique context of Te Moananui Oceania, where aside from Hawai'i, New Caledonia, and Aotearoa New Zealand, the majority of national populations are Indigenous (Lindstrom 2010), this guide emphasises the importance of understanding and working with Indigenous and local knowledge and socio-ecological systems in climate adaptation interventions.



Who and What is NUWAO?

This guide was created by the Nature-based Urban design for Wellbeing and Adaptation in Oceania (NUWAO) research team. NUWAO is a project funded by the New Zealand Government through a Royal Society of New Zealand Marsden grant, aiming to develop nature-based urban design solutions, driven by Indigenous knowledges that support climate change adaptation and individual and community wellbeing in diverse Te Moananui Oceania urban settings. We are a group of academics, ecologists, international development specialists, and urban, architectural, landscape, and spatial designers. The team is made up of both Indigenous and non-Indigenous researchers and professionals in Aotearoa New Zealand, Samoa, Vanuatu, Kiribati, and New Caledonia. Further details about NUWAO, the team, and our other research activities and resources are available at www.nuwao.org.nz.

What is the geographical scope of the NUWAO Nature-based Solutions Design Guide?

The guide relates to Te Moananui Oceania, which are the island nations and territories of the Pacific Ocean including Aotearoa New Zealand. The region is very diverse in all ways; languages, cultures, colonial histories and realities, world views, ecologies, geology, political contexts, and climate realities, so what works in one place in Te Moananui Oceania may not be appropriate in another. The ‘Pacific region’ is itself a debated construct (Koro et al., 2023). Despite this, Te Moananui Oceania is often linked through varied but shared concepts of relationality and circular time (described in some places as *tā*, *vā*, and *lā*) (Mahina, 2010; Koro et al., 2023), and by the shared and connecting Moana (Pacific Ocean) as a physical space, expertly and intimately known and navigated by Oceanic peoples for thousands of years (Martins, 2020) (fig 1). This echoes Hau’ofa’s (1994) notion of Te Moananui Oceania as a ‘sea of islands’, where the ocean does not separate islands, but rather connects them. In recognition of efforts to decolonise the language used to describe the region and to emphasise the interconnected nature of Te Moananui Oceania, we refer to Te Moananui Oceania rather than ‘Micronesia, Melanesia, and Polynesia’.

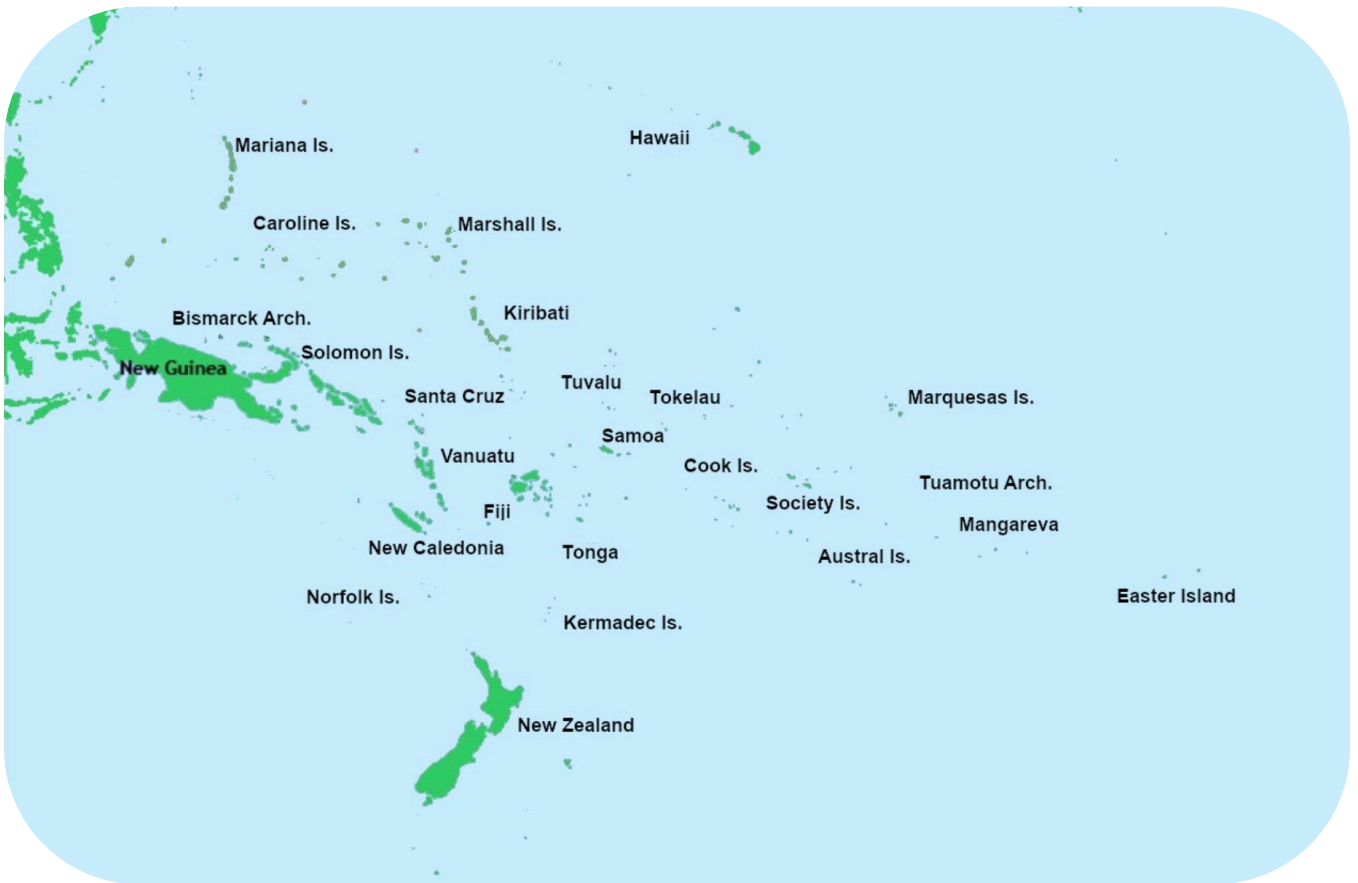


Figure 1 Te Moananui Oceania. Image by Sam Wood, 2024.

We highlight examples of NbS from the region that draw from both traditional wisdom and/or contemporary understandings. Where local examples are unavailable, we include case studies from other islands or coastal areas that could apply to Te Moananui Oceania. Our intention was to feature case studies that represent specific types of NbS rather than to include every example of NbS in the region. Additional details of NbS projects in Oceania may be found via The Kiwa Initiative.

This guide primarily concentrates on NbS case studies in urban environments. The reason for this is two-fold: firstly, urban NbS in the region have received comparatively less focus (Kiddle et al., 2021a), and secondly, with the majority of the global population residing in cities, urban areas are the primary places where the effects of climate change are experienced (Pedersen Zari et al., 2022). In Aotearoa New Zealand for example, approximately 87% of the general population and 85% of Tangata Whenua (the Indigenous peoples of Aotearoa New Zealand) live in urban centres. This is the result of a rapid urbanisation process in the 20th century (Ryks et al., 2019). In almost every Pacific island nation, the rate of urban population growth now surpasses overall national population growth rates (Kiddle et al., 2021b). Moreover, some of the highest rates of urbanisation globally are found in Te Moananui Oceania, particularly in the western nations, including the Solomon Islands and Vanuatu (Kiddle et al., 2021b).



Languages and Translation

The guide is written in English, but we have used local terms from across Te Moananui Oceania where necessary. Where possible, these terms are followed by an English translation in brackets, although some terms do not have direct translations. For further explanation of these terms, please refer to the glossary at the end of this guide. We hope to translate the guide into various other languages of Te Moananui Oceania if funding becomes available.

How does the NUWAO NbS Design Guide complement other NbS work in Oceania?

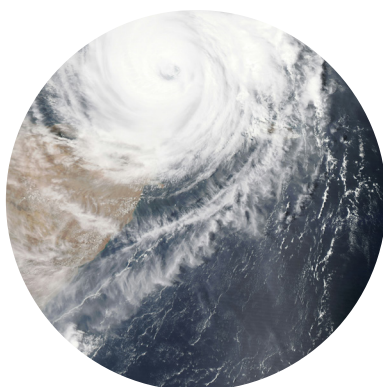
We have collaborated with regional organisations to align our work with the policy frameworks, practical implementation guides, and resource platforms concurrently being developed by the Secretariat of the Pacific Regional Environment Programme (SPREP) and The International Union for Conservation of Nature (IUCN). Our guide concentrates on identifying specific NbS strategies that would be effective in Te Moanaunui Oceania, with a focus on design. For guidance on policy, assessment methods, and further resources, we direct readers to the comprehensive materials provided by SPREP and IUCN.

Finding Nature-based Solutions in the NUWAO NbS Design Guide

We have organised the approximate 100 NbS in this guide into five online portals where you can search by considering:



1. Respecting Te Moananui interconnected living Ecologies



2. Working with nature to address climate change impacts



3. Working with nature to address societal issues



4. Nature-based solutions case studies by location



5. Nature-based solutions in alphabetical order

The sections which follow explain the importance of each portal and how the information is organised. We provide lists of NbS in each category here, but to access details, resources, and images for each NbS please go to the online version of the guide (www.nuwao.org.nz).

Respecting Te Moananui interconnected living ecologies

A defining feature of Indigeneity is the intrinsic relationship between humankind and the natural world, with Indigenous cultures paying deliberate attention to the responsibilities these relationships generate and giving active expression to them in many aspects of life (Tassell-Matamua et al., 2021). Indigenous worldviews often position humans as inseparable from living ecologies (Harmsworth & Awatere, 2013; Koro et al., 2023). In the same vein, ecological and climate wellbeing are often inseparable (Redvers et al., 2020). This tends to be true in Te Moananui Oceania, although perspectives vary, given Pacific peoples' diversity in cultures, languages, and worldviews. For example, in Aotearoa New Zealand, in Te Ao Māori (the Māori world-view), humans have whakapapa (genealogical/kinship) relationships with many aspects of the natural world, including Papatūānuku (the earth mother), as well as specific mountains, rivers, waterways and even plants. People are literally related to the land, and Indigenous peoples are called Tangata Whenua (people of the land). In Samoa, the word for earth, ele'ele, also means blood, highlighting that an integral part of human existence is the land itself (Powell & Fraser, 1892; Vaai, 2019). In Kiribati, people refer to the sea as their 'mother ocean' (Anterea, cited in Xuande & Yuting, 2021). Holistic health, wellbeing, and identity of people are therefore inherently connected to the eco-sphere. This relational worldview is fundamentally of Te Moananui Oceania and is at the core of Oceanic understandings of the world. Therefore, working with nature in the region holds different meaning and significance than in other parts of the world.

In Te Moananui Oceania, the understanding of a kind of life force that binds all living aspects of the world (including rivers, oceans, mountains, forests, and other entities or living systems often not acknowledged as being alive in Western science) has different names, all with variations in meaning. Examples include mauri (Aotearoa New Zealand), mo'ui (Tonga), maui (Hawaii'i and Samoa), oraanaga meitaki (Cook Islands), and wâdé (New Caledonia) (Krupa, 1996; Mataroa, 2023; Yates et al., 2024). These relationships are acknowledged in different ways throughout Te Moananui. For example, the mauri of rivers has been recognised in Aotearoa New Zealand through the granting of legal personhood to the Whanganui River as a means of Te Ao Māori centred care for the ecologies associated with the river, as a way to better reflect their meaning and mana (prestige, esteem) (Charpleix, 2018). The related Samoan concept of va-tapuia (sacred space) is a set of behavioural norms that dictates interactions between people and between people and the physical elements of the environment. Tamasese (2009) explains:

'...va-tapuia... literally refers to the sacred (tapu-ia) relationship (va) between humans and all things, animate and inanimate. It implies that in our relations with all things, living and dead there exists a sacred essence, a life force beyond human reckoning. The distinction here between what is living and what is dead is premised not so much on whether a life force, that

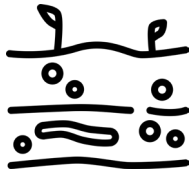
is, a maui or fatu manava, exists in the thing (that is, whether a life breath or heartbeat exudes from it), but whether that thing, living or dead, has a genealogy (in an evolutionary sense rather than in terms of human procreation) that connects to a life force.’

Va-tapuia gives rise to the principle of va-fealoai (mutual respect) which signifies culturally appropriate behaviour. Va-tapuia governs the way decisions are made in the aiga (family) as well as in fono (councils). Va-tapuia also governs the use of resources. Va-tapuia engenders attitudes that accept and respect the limits of human knowledge in relation to the physical environment (Aiono Le Tagaloa, 1996a; Aiono Le Tagaloa, 1996b; Tamasese, 2007). Sa (taboo), as related through oral traditions, protects vulnerable species and sacred spaces, and prevents the exploitation of forests, marine areas and water sources (Latai, 2009). Other similar, but diverse examples of important relational principles in Te Moananui Oceania include sautu in Fiji, fakaaloalo in Tuvalu, fakaapaapa in Tonga, and piri’anga in Niue (Vaai, 2019).

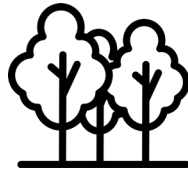
This guide provides a method for searching and understanding NbS by drawing on the concept of interconnected living systems specific to Te Moananui Oceania. Organising the information in this way is a means to forefront respecting and nurturing the living world akin to generalised Indigenous understandings of how to live well within ecologies over multi-generational periods in Te Moananui Oceania. The intention is to understand how NbS can be a means to strengthen mauri, vā and related concepts, and centre an Indigenous way of framing relationships to the living world and approaches to working with nature for increased collective wellbeing. This approach contrasts with a typical Western approach, which often focuses on solving specific problems or issues within the urban environment, such as the impacts of climate change or societal challenges.

In this part of the guide, NbS are organised into realms of connected living systems. In Te Moananui Oceania, in traditional contexts, each of these realms would often be overseen by specific deities or gods called Atua (Aotearoa, Cook Islands, Samoa), Akua (Hawai’i), or ‘Otua (Tonga). Atua is the word we will use here. The interconnectedness between humans and nature is reflected in the oral traditions, stories, and legends passed down through generations. These stories often depict the origins of the islands, the formation of the land, and the profound influence of Atua and nature on the lives of the people. Others have explored the idea of working with the realms or domains of Atua before us such as Mataroa (2023) and Harmsworth and Awatere (2013). Our intention is not to try to define complex and diverse traditional spiritual beliefs in the region but to highlight how aspects of the natural world are sometimes made sacred by deification, personification, and genealogy connections to illustrate the unique relationships peoples of Te Moananui Oceania have with the living world. In turn, this may broaden understanding of NbS in the region and aid in more effective design processes and outcomes.

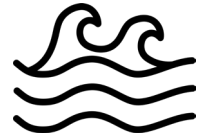
Ways to understand different parts of the living world and Atua themselves vary greatly across the region, however here we use six realms of Te Moananui Oceania interconnected living ecologies:



Respecting the earth, soil, and underground forces



Respecting forests and other land ecologies



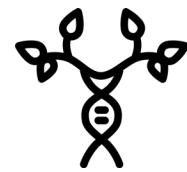
Respecting the ocean and waterways



Respecting plants, both wild and cultivated



Respecting the sky (sun, moon, stars, and weather)






























































































































Respecting lineage, genealogy, and native biodiversity




































Nbs:

Realm:

Bio accretion / mineral accretion				
Bio-filters				
Bio-facades				
Bioremediation / phytoremediation: soil				
Bioremediation / phytoremediation: water				
Bio-shading				
Bioswales / swales				
Botanical gardens				
Building-integrated carbon storage				
Coastal setback (vegetated)				
Community gardens				
Companion planting / intercropping				

Composting / vermiculture toilets						
Constructed Reefs						
Constructed salt marsh / mudflats						
Container gardens						
Coral Reseeding						
Customary resource management						
Ecological Islands						
Ecosystem-based management						
Edible Home Gardens						
Façades for bird safety						
Fish aggregation devices						
Flood resilient structures						
Floodplain restoration						
Flow forms						
Green / wildlife corridors, bridge, belts						
Green / living walls						
Green / living roofs						
Indoor (food) gardens / greenhouses						
Insect / bee hotels and nesting boxes						
Living crib walls / brush mattresses						
Living Machines						
Living seawalls / biodiversity tiles						
Living shorelines						
Managed Realignment (intertidal)						
Mangrove Restoration						

Medicinal gardens				
Mulch				
Nature-based stormwater management				 
Permaculture				
Planting for biodiversity				
Pollinator pathways				
Pervious surfaces				
Rainwater Gardens				
Rainwater Harvesting				
Revegetation / renaturing			 	
Riparian restoration				
River Daylighting				
River rewilding				 
Sand dunes: artificial				
Sand dunes: preservation/restoration/stabilisation				
Stepping stone habitats				
Slow-forming terraces				
Sponge cities				
Te buibui (coastal brush structures)				
Traditional Calendars				 
Urban beehives				
Urban blue-green spaces				
Urban composting				
Urban food forests / orchards				
Urban forests				

Urban fountains and water features			
Urban orchards / edible landscapes			
Urban street trees / transport corridors			
Urban wildlife sanctuaries			
Uwhi (woven aquatic mats)			
Vertical farms			
Vegetation-integrated buildings			
Waffle gardens			
Water-caused erosion prevention			
Wetlands: constructed			
Wetlands: restoration or preservation			
Wind-caused erosion prevention			
Mātauranga Māori values driven management			   
Tara bandu (management / justice)			   
Xeriscaping			 

Te Moananui Oceania's diversity is so vast that its Atua, like Tonga's Hikule'o, or Kiribati's Nareau, or Nauru's Areop-Enap, cannot be easily categorised or grouped neatly. Some Atua operate across different realms or hold higher status than others, such as many of the gods associated with the realm of the moana (oceans). Examples include Tangaroa (Cook Islands, Rapanui, Aotearoa), Kanaloa and Kū (Hawai'i), Detora (Nauru), Tagaloa (Samoa), Tangagoa (parts of Solomon Islands), Tagaro (part of Vanuatu), Ta'aroa (Tahiti), and Tangaloa (Tonga). Atua such as Papatūānuku and Rūaumoko (Aotearoa), Papahānaumoku and Honua (Hawai'i), Hikule'o (Tonga), and Papa (Cook Islands) are associated with the earth mother, and underground forces, sometimes understood as a separate child of the earth mother. Important Atua linked to forests and other land ecologies include Hawai'i's Kāne and Aotearoa's Tānemahuta. As expert navigators who used the stars to traverse the oceans, many Oceanic people hold a deep respect for the sky and its elements, including the sun, moon, stars, and weather, each in their own distinct ways. Atua of this realm include Vatea (Cook Islands), Na Atibu and Na labu (Kiribati), Wākea and Hina (Hawai'i), and Ranginui, the sky father and Tāwhirimatea, one of his children and Atua of wind (Aotearoa). Atua of plants, particularly in 'Polynesia' are sometimes separated into ones that are associated with wild plants and those that are associated with cultivated plants such as Lono and Haumea (Hawai'i), Haumia-tiketike and Rongomātāne (Aotearoa) and Rongo (Cook Islands). Many Atua, and elements of their realms, such as rivers, bodies of water, plants, animals, and people are connected in various lineages and genealogical relationships. The concept of honouring and valuing relationships, ancestry, lineage, and interconnectedness is fundamental to many worldviews across Te Moananui Oceania.

When considering the importance of traditional spiritual beliefs and wellbeing concepts in Te Moananui Oceania, it is important to recognise the effects of Western colonialism. Individual nations from the region have very different experiences of colonisation, however, a common phenomenon accompanying colonisation has been the conversion of many Oceanic peoples to Christianity (Vaai, 2019). The majority of Indigenous inhabitants of most Pacific Island countries consider themselves to be Christian. Mihaere et al. (2024) discuss the importance of Christian beliefs in Te Moananui and their evolution in potential relationship to NbS. It may be possible to integrate concepts of spirituality drawn from both traditional beliefs and unique local Christian religious practices, in ways that resonate with local people in the region.



Working with nature to address climate change impacts

Communities of Te Moananui Oceania live in diverse contexts but face common challenges. These include a tendency to live in geographical locations that are particularly prone to the impacts of climate change (UNESCAP, 2019); high dependence on land and ocean ecologies for basic needs and economic security (for example, food, shelter, medicines, and fuel); and experience of economic deprivation as well as social and political marginalisation (Bailey-Winiata, 2021), that has often, but not in all nations of the Pacific, been exacerbated by complex histories and on-going realities of colonisation (Mihaere et al., 2024). Efforts to adapt to climate change in Te Moananui Oceania are diverse and are occurring at a rapid pace. NbS is one of multiple strategies to adapt to climate change. NbS could and in some places in Te Moananui Oceania do already play a key role in adaptation efforts, enabling multiple co-benefits to evolve that focus on revitalising ecological health, and (if designed well) improve human wellbeing while focusing on climate change impacts.

The imperative to adapt to climate change is both urgent and critically important in Te Moananui Oceania. In Te Moananui Oceania, the rise in extreme weather events such as cyclones, floods and droughts is causing the displacement of people, as well as death, injury and psychological trauma (Gibson et al., 2020; Tiatia et al., 2022). Indirectly, human health in Te Moananui Oceania is at risk due to the adverse effects of climate change on ecosystems, which are crucial to human wellbeing. Many Indigenous peoples of the region consider the health of these ecosystems to be inseparable from human wellbeing (Holman-Wharehoka, 2023).

Climate change is expected to exacerbate existing social and health disparities both between and within nations (Woodward and Porter, 2016; Levy et al., 2017), with traditionally marginalised Indigenous populations likely to be impacted disproportionately (United Nations, 2016). This includes many communities across Te Moananui Oceania. This raises concerns because global responses to climate change have largely followed Western hegemonic understandings of health and ecological systems (Jones et al., 2014). Therefore, there is a pressing need for Indigenous-focused and led initiatives that prioritise wellbeing and working with nature to effectively adapt to climate change (Mihaere et al., 2024; Kiddle et al., 2021a).

This guide organises NbS into twenty-two categories that correspond to key specific climate change impacts for the region. Our aim is to simplify the process of aligning specific NbS with corresponding climate change impacts. This approach recognises that effective multi-scalar NbS interventions typically consist of a variety of different NbS strategies. It is important to design for multiple climate change impacts as well as wellbeing for humans and broader living ecologies while designing NbS projects. Although all design that works with nature is inherently tailored to specific sites, many NbS strategies address multiple climate change impacts at the same time, so appear across different categories in this guide.

Climate change significantly impacts biodiversity and biomass land cover. Given that NbS inherently aims to enhance ecological health and thus biodiversity, and because most NbS involve vegetation, it is reasonable to assume that all NbS contribute to mitigating biodiversity and biomass loss. Therefore, we have not listed this as a separate category but have included the more specific issues of ‘changes in phenology’ and ‘increase of pests/weeds’. Similarly, another major climate change impact is negative outcomes for human health and wellbeing. Because all NbS should improve both ecological health and human wellbeing, we have not included a separate human wellbeing category, though we retain ‘increased incidence/distribution of disease’ as a specific category. We acknowledge that the key drivers and causes of climate change must be mitigated and that there are very real limits to the extent that many islands in Te Moananui Oceania can effectively adapt to the impacts of climate change over the long term. The climate change impact categories are:



Land Issues

- Increased temperatures
- Increased wildfire
- Landslides/erosion
- Loss of food production
- Reduced air quality
- Reduced soil quality
- Urban heat island effect
- Wind and storm damage



Water Issues

- Changes in rainfall
- Coastal erosion
- Coastal inundation and storm surge
- Desertification
- Drought
- Flooding
- Glacial retreat and snow cover change
- Ocean acidification
- Reduced freshwater availability/quality
- Salt-water intrusion into aquifers
- Sea level rise



Biodiversity Issues

- Changes in phenology
- Increased pests/weeds
- Shifts in disease patterns

For details of which NbS strategies might be useful for each climate change impact please refer to the online version of the guide.



Working with nature to address societal issues

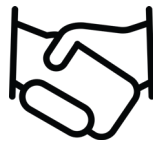
The United Nations highlights the importance of individual and communal wellbeing in people's development (Yates et al., 2022). Yet wellbeing as articulated and measured in typical Western metrics tends to be individualistic. In contrast, a common thread running through the world's diverse Indigenous populations is the collective nature of wellbeing (Durie, 1994). Indigenous concepts of wellbeing tend to recognise the interconnected relationships of people with ecosystems and biodiversity, especially related to ancestral lands, oceans and waterways, or specific animal species which Indigenous peoples often are connected to and depend upon for their collective flourishing (Durie, 1985). This is true across Te Moananui Oceania. Wellbeing for Pacific peoples is communal, linked closely to the spiritual world, and is influenced by relationships with island and ocean environments, the plants and animals they share these ecologies with, the ecosystem services that these environments provide, as well as stars, weather patterns, and ocean currents (Carter, 2018; Bryant-Tokalau, 2018).

Local definitions and models of wellbeing are dynamic and continually evolving. However, in Te Moananui Oceania, concepts of wellbeing are often place-based, emphasising the need for context-specific and nuanced understandings of wellbeing when working in the uniquely diverse Oceanic region. Pacific peoples' understandings of wellbeing and identity tend to be grounded in relationships and collectivism (Lautua, 2023). Urban areas in Te Moananui Oceania are grappling with complex challenges stemming from rapid urbanisation and socio-economic inequalities, alongside significant climate and ecological pressures.

In the guide, NbS are organised into the following six categories of key specific societal challenges in the region:



Disaster risk reduction and resilience building



Empowerment/equality



Energy Security



Food Security



Freshwater security and quality



Waste management and sanitation

Nbs:

Realm:

Backyard gardens



Bio accretion / mineral accretion



Bio-filters



Bio-facades



Bioremediation / phytoremediation: soil



Bioremediation / phytoremediation: water



Bio-shading



Bioswales / swales



Botanical gardens



Building-integrated carbon storage

























































































































Coastal setback (vegetated)





































Community gardens



Companion planting / intercropping					
Composting / vermiculture toilets					
Constructed Reefs					
Constructed salt marsh / mudflats					
Container gardens					
Coral Reseeding					
Customary resource management					
Ecological Islands					
Ecosystem-based management					
Edible Home Gardens					
Façades for bird safety					
Fish aggregation devices					
Flood resilient structures					
Floodplain restoration					
Flow forms					
Green / wildlife corridors, bridge, belts					
Green / living walls					
Green / living roofs					
Indoor (food) gardens / greenhouses					
Insect / bee hotels and nesting boxes					
Keyline design					
Living crib walls / brush mattresses					
Living Machines					
Living seawalls / biodiversity tiles					
Living shorelines					

Managed Realignment (intertidal)					
Mangrove Restoration					
Medicinal gardens					
Mulch					
Nature-based stormwater management					
Permaculture					
Planting for biodiversity					
Pollinator pathways					
Pervious surfaces					
Rainwater Gardens					
Rainwater Harvesting					
Revegetation / renaturing					
Riparian restoration					
River Daylighting					
River rewilding					
Sand dunes: artificial					
Sand dunes: preservation/restoration/stabilisation					
Stepping stone habitats					
Slow-forming terraces					
Sponge cities					
Te buibui (coastal brush structures)					
Traditional Calendars					
Urban beehives					
Urban blue-green spaces					
Urban composting					

Urban forests					
Urban fountains and water features					
Urban orchards / edible landscapes					
Urban street trees / transport corridors					
Urban wildlife sanctuaries					
Uwhi (woven aquatic mats)					
Vertical farms					
Vegetation-integrated buildings					
Waffle gardens					
Water-caused erosion prevention					
Wetlands: constructed					
Wetlands: restoration or preservation					
Wind-caused erosion prevention					
Mātauranga Māori values driven management					
Tara bandu (management / justice)					
Xeriscaping					

Biodiversity conservation or regeneration, and climate change adaptation are societal issues of immense importance (Pedersen Zari et al., 2022). Because almost all NbS inherently focus on aspects of ecological regeneration and are frequently employed in climate adaptation planning, we have chosen not to list these two categories separately in this guide. We assume that nearly all of the 100 strategies outlined in the guide would fit into these categories. Similarly, all NbS by definition must have human wellbeing outcomes so while human health and wellbeing as well as economic and social development are also key societal challenges in Te Moananui Oceania, we have left these categories out assuming that all NbS will contribute in some way to these challenges. Many NbS strategies address multiple societal challenges so various NbS occur across several different categories here.



NbS by location

The Pacific Ocean spans about a third of the surface of the Earth, covering an area of more than 155 million square kilometres. This makes it larger than the landmass of all the continents combined. Despite its actual size, the area of land in Te Moananui Oceania is only approximately 800 thousand square kilometres. Nine-tenths of this is in Papua New Guinea and Aotearoa New Zealand (Foster & West, 2024). Case study locations collated for this guide vary from the north to the south of Te Moananui Oceania and from the east to the west, spanning hemispheres and covering a wide range of climates, bioregions, and island types, from Aotearoa's temperate and alpine continental islands including glaciers and high peaked mountains in the south, to Kiribati's atoll tropical climate and Hawai'i's high volcanic islands in the north.

The case studies collated for this guide illustrate the importance of appropriate research methods, design frameworks, and design practices that forefront Indigenous values, knowledge, and wellbeing in the creation of NbS in Te Moananui Oceania. More consciously considering local worldview and cultural values during (co-)designing processes will make NbS more locally relevant, effective, and likely to have positive wellbeing outcomes for interconnected socio-ecological systems (Mihaere et al., 2024). Searching by location may enable designers and decision-makers to understand the kinds of NbS that are already being undertaken in a specific place. We have not sought to find every example of urban NbS in Te Moananui Oceania, just ones that illustrate the general NbS strategies. A small number of case studies from outside the region are included where none could be found in Te Moananui Oceania, to illustrate the potential of the strategies for the region.

Other databases and portals will illustrate other Te Moananui urban NbS case studies such as from the Kiwa Initiative. NbS case studies from other parts of the world can be found in ClimateScan and the Urban Nature Atlas. Other databases showcase rural NbS such as the NbS Initiative Case Study Platform. The NUWAO NbS Design Guide currently includes Te Moananui Oceania case studies from:

American Samoa

- The Watershed Partnership Initiative, Tutuila



Aotearoa New Zealand

- Earthship Te Timatanga, Hikuai, Coromandel
- Auckland Botanic Gardens, Tāmaki Makaurau Auckland
- Auckland Central Library Living Roof, Tāmaki Makaurau Auckland
- Bees Up Top, Tāmaki Makaurau Auckland
- Britomart East Complex, Tāmaki Makaurau Auckland
- Community Compost (bEartha Project), Whakatū Nelson
- Composting Toilets, Matapōuri
- East Street Water Feature: Three Rivers, Hakatere Ashburton
- Fonterra Headquarters Living Façade, Tāmaki Makaurau Auckland
- Greengrower Vertical Farm, Kirikiriroa Hamilton
- Hakanoa Reserve Pollinator Pathway, Tāmaki Makaurau Auckland
- Homes for Creatures – Hobsonville’s Habitat Markers, Tāmaki Makaurau Auckland
- Hundertwasser Wairau Māori Arts Centre Intensive Green Roof, Whangārei
- Kelmarna Community Garden, Tāmaki Makaurau Auckland
- Kete Tiles, Te Whanganui a Tara Wellington
- Kopupaka Reserve, Tāmaki Makaurau Auckland
- La Rosa Reserve Stream Daylighting, Tāmaki Makaurau Auckland
- Long Bay Neighbourhood Development, Tāmaki Makaurau Auckland
- Maramataka, Aotearoa
- Ōtākaro Orchard Blue-green Roof, Ōtautahi Christchurch
- OMG Urban Farm, Tāmaki Makaurau Auckland
- Paul Matthew’s Drive Bioretention System, Tāmaki Makaurau Auckland
- Pūharakekenui River Catchment, Ōtautahi Christchurch
- Restoring Ōtuwharekai, Hakatere Ashburton
- St Marks Apartments, Tāmaki Makaurau Auckland
- Tarawera River, Bay of Plenty
- Taiea te Taiao, Maungatautari to Pirongia Ecological Corridor Project, Waipā District
- Te Tāpui Atawhai Auckland City Mission Homeground Rooftop Garden, Tāmaki Makaurau Auckland
- The Discovery Garden, Te Whanganui a Tara Wellington
- The Living Pā, Te Whanganui a Tara Wellington
- The Wellington Town Belt Management

- Plan, Te Whanganui a Tara Wellington
- Uwhi in Te Arawa Lakes, Rotorua
- Waikawa Estuary Salt Marsh Restoration, Tauihu Marlborough
- Waiwhakareke Natural Heritage Park, Kirikiriroa
- Wellington Cable Car Bird Strike Prevention Project, Te Whanganui a Tara Wellington
- Whanagamatā Dune Reconstruction, Whangamatā
- Wynyard Quarter, Tāmaki Makaurau Auckland

Federated States of Micronesia

- Kosrae Shoreline Management Plan, Kosrae



Fiji

- Fiji Locally Managed Marine Area Network, Fiji
- Colo-I-Suva Forest Park, Suva
- Great Sea Reef Conservation and Climate Resiliency Program, Fiji
- Viti Levu Conservation Corridor, Viti Levu

Hawai'i

- Hālawa Xeriscape Garden, Honolulu
- Hua Orchards Windbreaks, Waialua
- Keālia Pond National Wildlife Refuge, Maui

- Kapukaulua Dune Restoration Project, Kapukaulua
- Limahuli Valley Terraces, Kauai
- The Hawai'i Nature Center Green Machine, O'ahu

Kiribati

- Birnie Island Bird Sanctuary, Phoenix Island group
- Te Buibui, Aonobuaka on Abaiang

Mā'ohi Nui (French Polynesia)

- Mā'ohii Fish Traps, Tōtaiete mā (The Society Islands)

Marshall Islands

- Rainwater Harvesting in the Marshall Islands, Namu, Lib, and Kwajalein



New Caledonia

- Parc Provincial Zoologique et Forestier Michel Corbasson, Nouméa

Papua New Guinea

- Mangrove Rehabilitation for Sustainably Managed Healthy Forests (MARSH), PNG
- Namie Mine Phytoremediation, Wau District



Samoa

- Mickaele Maiava's Organic Keyhole Gardens, Moamoa
- Vailima Botanical Gardens

Solomon Islands

- Solomon Islands Village Shelters, Western and Choiseul Provinces
- SWoCK Project Backyard Organic Farming, Langalanga Lagoon

Tokelau

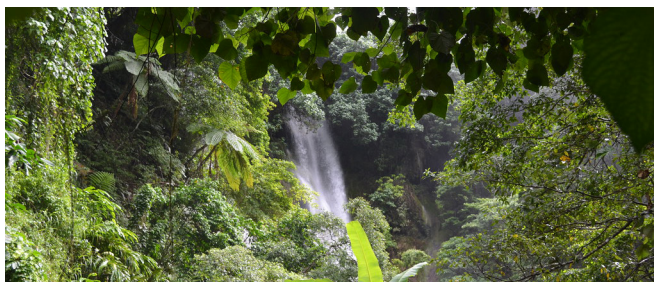
- Cyclone Percy Development, Atafu

Tonga

- Ene'io Botanical Garden, Vava'u
- Vegetative Mulches, Tonga

Tuvalu

- Tuvalu Food Cubes, Funafala



Vanuatu

- Tagabe River Ecosystem Restoration, Port Vila
- Urban Forestry Project, Port Vila

Outside of Te Moananui Oceania:

Australia

- Heron Island and One Tree Island, Great Barrier Reef, Queensland
- Mars Assisted Reef Restoration System (MARRS), Green Island, Queensland
- Platinum Apartments, Melbourne, Australia
- Scott' Point Living Shoreline, New South Wales
- Taranaki Farm, Central Victoria, Victoria
- Volvo Living Sea Walls, Sydney, New South Wales

Germany

- The Bio Intelligent Quotient (B.I.Q.) Building, Hamburg

Timor Leste

- Tara Bandu for Coastal and Marine Resource Management, Biacou

United States of America

- Belle Island Brush Mattressing, Portland, Oregon
- Zuni Pueblo Waffle Gardens and the Zuni Sustainable Agriculture Project, New Mexico



Alphabetical order

The complete list of NbS included in the guide in alphabetical order follows. For ease of use, we have combined some NbS that have different types into one category. Green walls are an example, where five different kinds of green walls appear under just one heading.

B

- Backyard gardens
- Bio-accretion / mineral accretion
- Bio-facades
- Bio-filters
- Bioremediation / phytoremediation: soil
- Bioremediation / phytoremediation: water
- Bioretention systems / rainwater gardens
- Bio-shading
- Bioswales / swales
- Botanical gardens
- Building-integrated carbon storage

C

- Coastal setbacks (vegetated)
- Community gardens
- Companion planting / intercropping
- Composting / vermiculture toilets
- Constructed reefs / living breakwaters
- Constructed salt marsh / mudflats
- Container gardens
- Coral reseeding
- Customary resource management

E

- Ecological islands
- Ecosystem-based management

F

- Façades for bird safety
- Fish aggregation devices
- Flood resilient structures
- Floodplain restoration
- Flow forms

G

- Green / living walls
- Green / living roofs
- Green / wildlife corridors, bridges, belts

I

- Indoor (food) gardens / greenhouses
- Insect / bee hotels and nesting boxes

K

- Keyline design

L

- Living crib walls / brush mattresses
- Living machines
- Living seawalls / biodiversity tiles
- Living shorelines

M

- Managed realignment (intertidal)
- Mangrove restoration
- Mātauranga Māori values driven management
- Medicinal gardens
- Mulch

N

- Nature-based stormwater management

P

- Permaculture
- Pervious surfaces
- Planting for biodiversity
- Pollinator pathways

R

- Rainwater harvesting
- Revegetation / renaturing
- Riparian restoration
- River daylighting
- River rewilding

S

- Sand dunes: artificial
- Sand dunes: preservation / restoration / stabilisation
- Slow-forming terraces
- Sponge cities
- Stepping stone habitats

T

- Tara bandu (management / justice)
- Te buibui (coastal brush structures)
- Traditional calendars

U

- Urban agriculture
- Urban beehives
- Urban blue-green spaces
- Urban composting
- Urban forests
- Urban fountains and water features
- Urban orchards / edible landscapes
- Urban street trees / transport corridors
- Urban wildlife sanctuaries
- Uwhi (woven aquatic mats)

V

- Vegetation-integrated buildings
- Vertical farms

W

- Waffle gardens
- Water-caused erosion prevention
- Wetlands: constructed
- Wetlands: restoration or preservation
- Wind-caused erosion prevention

X

- Xeriscaping



Findings and themes

During the process of producing the NUWAO Nature-based Solutions Design Guide for Te Moananui Oceania, we identified several themes.

The peoples of Te Moananui have always worked with nature

Many Indigenous communities across Te Moananui Oceania already have a tradition of working with nature closely as part of their traditional and often contemporary worldview and practice. Unique NbS exist in the region, derived from people's deeply connected understanding of place, ecology, and climate (Nunn et al., 2024). These work with local cultural values, world views, and conceptualisations of time, space, and relational understandings, bound up with concepts such as mauri and vā as discussed earlier. NbS could, and in some places in Te Moananui Oceania do already play a key role, enabling multiple co-benefits to evolve that focus on revitalising ecological health, and if designed well, also improve wellbeing (Pedersen Zari et al., 2019).

NbS that reflect culture and worldview with integrity are likely to be more effective

Worldviews related to human-nature relationships influence the design and acceptance of NbS. Leveraging the quality and variety of opportunities for human-nature relationships in urban contexts, and understanding how spatial experiences are linked through time is important in the creation of NbS that result in enhanced human wellbeing in Te Moananui Oceania. Experiencing and valuing nature-human relationships differs between various cultural groups (Sangha et al., 2018), and certainly this is true in Te Moananui Oceania, but to date, most examples of NbS do not deeply consider how cultural diversity and the differences between the preferences or needs of various groups of people can be more effectively explored and integrated into design practice (Cottrell 2022). Exploration of this is an opportunity for design-led research focused on NbS in Te Moananui Oceania (and in other parts of the world).

Working with nature in Te Moananui is meaningful and political

Working with nature in the context of Te Moananui Oceania is, or could be, a deeply meaningful, potentially spiritual, and certainly a political act in the context of decolonisation and re-Indigenisation (Abbott et al., 2022). People seeking to employ NbS in Te Moananui Oceania should be aware of this in planning, design, and participatory processes, and in planning overall design goals, outcomes, ongoing maintenance, and monitoring and evaluation processes.

NbS processes are as important as outcomes

It is not just the technical measurable outcomes of NbS that determine their compatibility with local concepts of wellbeing and living ecologies in Te Moananui Oceania, but the overall frameworks of relational understanding, and the processes undertaken to arrive at and evolve NbS that are important (Mihaere et al., 2024). Exploration of this is an opportunity for design-led, participatory, and other forms of research focused on an expanded notion of NbS, not just as a technical approach to climate change adaptation, but also a culturally nuanced one.

Motivation and positionality are important

The motivation and positionality behind NbS that centre worldview-driven local ideas and practices of wellbeing is likely to be of vital importance to their effectiveness in the Te Moananui Oceania context. This should be made transparent by funders, designers and planners, managers, and other people involved in NbS design and implementation, and indeed all forms of climate adaptation work to avoid accidental neo-colonisation in the region (Cottrell, 2022; Mihaere et al., 2024).



Conclusion

Just and culturally effective NbS for Te Moananui Oceania

This Nature-based Solutions Design Guide for Te Moananui Oceania represents a step towards beginning to reshape the urban and peri-urban landscapes of Te Moananui Oceania in ways that reflect local values and relationships as the climate continues to change. Indigenous-focused and led approaches are critical in the design of NbS in the region, including those aiming for wellbeing and adaptation to climate change and biodiversity loss. NbS design that considers human cultural relationships to land, ocean, and other aspects of the living world is an important contributor to a more holistic notion of ecological urban regeneration. This is of great importance for safeguarding both the physical and psychological wellbeing of individuals and communities in the coming decades as humanity increasingly becomes urbanised, and as people must learn to create, adapt, and live in urban environments in a greatly changed ecological and climatic context. Taking a socio-ecological approach to NbS is also vital in justice-oriented understandings of climate change adaptation interventions, which is important in the diverse and complicated colonisation and post-colonisation contexts of Te Moananui Oceania.

A crucial next step in implementing effective NbS in Te Moananui Oceania is to ensure that these solutions foster culturally appropriate and just climate adaptation. This involves achieving outcomes that uphold cultural values and support self-determination for local and Indigenous people. Culturally appropriate NbS must be informed by localised understandings of wellbeing to tap into potentially culturally meaningful NbS and to ensure that NbS aid in social and climate justice agendas rather than contribute to injustice, even if unintentionally. For local and Indigenous peoples of Te Moananui Oceania, these understandings are diverse but are linked by centring human-ecological relationships, spirituality, and understandings of connectedness. The understanding of human-ecological roles, values, and relationships in Te Moananui Oceania differs significantly from common European or North American perspectives on interactions between people and nature. This is where many 'standardisations' of NbS terms and processes come from, however. There is a pressing need for these standardisations, including terms, methods, and evaluation frameworks, to be adaptable enough to be relevant in specific localised contexts, especially in areas where Indigenous peoples reside.

As Cottrell (2022, p. 167) points out, ‘future assessment and revisions to... [NbS] standards should build upon the inclusion of Indigenous peoples and local communities and strive to better validate, integrate, and protect Indigenous local knowledge in NbS projects’.

If cultural considerations are not prioritised in design and planning, adaptation efforts may not support the concept of ‘a good life’ and could result in further marginalisation of Indigenous peoples. In essence, for NbS to be effective, they need to be localised, not only related to the ecological and climatic conditions of a site but they also should align with local cultural knowledge and values. In climate change adaptation efforts, including NbS projects, there is an opportunity to place Indigenous local knowledge and voices at the heart of decision-making. Embracing a new (or rekindling an older) approach to our relationship with each other and the living world, one that honours human interdependence with ecological systems, and is informed by Indigenous knowledge and equitable power sharing is crucial. Advocates and practitioners of NbS have a responsibility to support this transformative shift, regardless of cultural background, particularly in Te Moananui Oceania.

Effective design and implementation of Nature-based solutions in Te Moananui Oceania should:

- 1 Promote long-term resilience and regeneration and understand the interconnectedness of socio-ecological systems.
- 2 Be driven by an understanding of local Indigenous cultures, knowledges, and values.
- 3 Be based on local wellbeing paradigms and not solely on Western science understandings or measurements of climate change impacts or ecological health.
- 4 Ensure equitable and just outcomes for local communities, and work to provide co-benefits that address social, economic, and environmental justice issues alongside responding to climate concerns.
- 5 Recognise and prioritise Indigenous leadership and decision-making, and local hierarchies of power and decision-making. Indigenous peoples should be partners, not merely stakeholders. NbS should be led by and/or co-designed with local communities.
- 6 Be teamed by proponents who understand the political nature of climate change actions and become advocates for system change.

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Available online at www.nuwao.org.nz.

Glossary

The NUWAO Nature-based Solutions Design Guide for Te Moananui Oceania uses various non-English terms from across the region. These words appear in alphabetical order here, with reference to the place of origin at the beginning of the English translation. We have not included the names of various Atua (deities).

Ahupua'a	Hawai'ian: Customary resource management
Aiga	Samoa: Family
Airani Tangata	Kuki Airani (Cook Islands): Island people
Aorangi	Kuki Airani (Cook Islands): Total environment
Aotearoa	Aotearoa: Literally 'the land of the long white cloud'; the common Te Reo Māori name for New Zealand
Akua	Hawai'i: God/s or deities
Atua	Aotearoa, Kuki Airani (Cook Islands), Samoa: God/s or deities
Aua i'a	Mā'ohi Nui French Polynesia: fish ponds
Awa	Aotearoa: River/s, stream, waterway
Bul	Palau: A form of customary resource management
Bure	Fiji: Traditional house
Ele'ele	Samoa: Earth, blood
Enua	Kuki Airani (Cook Islands): Land
Fatu manava	Samoa: Heart, mind, seat of emotions
Fale tele	Samoa: type of traditional house
Fono	Samoa: Council
Fonofale	Samoa: House of support; model of wellbeing for Pacific peoples
Foto Samoa	Samoa: Healer, shaman
Hauora	Aotearoa: Health

Kahuna	Hawai'i: Healer, shaman
Kai	Aotearoa: Food
Kāinga	Aotearoa: Traditional Māori settlements
Kaitiaki/tanga	Aotearoa: Guardian/ship
Kopapa	Kuki Airani (Cook Islands): Physical wellbeing
Kopu Tangata	Kuki Airani (Cook Islands): Family, social wellbeing
Kōrero Tuku Iho	Aotearoa: Māori oral tradition
Kuki Airani	Kuki Airani (Cook Islands): Cook Islands
Lei	Hawai'i: Traditional flower garland
Mahinga kai	Aotearoa: Natural resources within local ecosystems
Mana	Aotearoa: Prestige, authority, control, power, influence, status, charisma
Māori	Aotearoa: Indigenous people of Aotearoa New Zealand, (also māori - normal, ordinary, natural, usual, common)
Mātauranga Māori	Aotearoa: Indigenous Māori knowledge
Maunga	Aotearoa, Kuki Airani (Cook Islands): Mountain/s
Mauli	Hawai'i. Life force that binds all living aspects of the world (including rivers, oceans, mountains, forests and other 'entities' not often acknowledged as being alive in Western science)
Mauri	Aotearoa: Life force, life essence, the ephemeral. Life force that binds all living aspects of the world
Māra kai	Aotearoa: Food garden
Mo	Marshal Islands: A form of customary resource management
Moana	Polynesia: Ocean
Mo'ui	Tonga: Life force that binds all living aspects of the world (including rivers, oceans, mountains, forests and other 'entities' not often acknowledged as being alive in Western science)
Ngāhere	Aotearoa: Forest/s, bush
Noa	Aotearoa: Unrestricted, safe, good

Oraanga Meitaki	Kuki Airani (Cook Islands): Wellbeing, health, and vitality; life force that binds all living aspects of the world (including rivers, oceans, mountains, forests and other 'entities' not often acknowledged as being alive in Western science)
'Otua	Tonga: God/s or deities
Pākehā	Aotearoa: New Zealanders of European descent
Pātaka	Aotearoa: traditional raised food storehouse
Peu Kuki Airani	Kuki Airani (Cook Islands): The culture of the Cook Islands
Pito'enua	Kuki Airani (Cook Islands): Health and Wellbeing
Pūrākau	Aotearoa: Traditional oral Māori stories - these stories hold important knowledge, names and relationships to place/s, kinship stories
Qoliqoli	Fiji: Fishing grounds
Rahui/Rāhui	Polynesia: a prohibition against a particular area or activity, typically one in force temporarily in order to protect a resource. A form of customary resource management.
Rāranga	Aotearoa: traditional weaving
Ra'ui	Kuki Airani (Cook Islands): A form of customary resource management.
Rohe	Aotearoa: tribal territory, homeland
Rongoā	Traditional Māori medicinal practices.
Tabu	Fiji, Vanuatu, Kiribati: A form of customary resource management.
Tambu	Papua New Guinea: A form of customary resource management.
Taonga	Aotearoa: treasure
Tapa	Tonga, Samoa, Fiji, Niue, Kuki Airani (Cook Islands), French Polynesia, Solomon Islands, Hawai'i etc.: Traditional cloth made of bark
Tapu	Tonga: A form of customary resource management
Tapu	Aotearoa: Forbidden, spiritually unsafe

Tangata	Aotearoa, Kuki Airani (Cook Islands): People
Tangata Whenua	Aotearoa: literally people of the land; Aotearoa's Indigenous peoples.
Tapere	Kuki Airani (Cook Islands): Form of living landscape design.
Taulasea	Samoa: Healer, shaman
Te Ao Māori	Aotearoa: The Māori world and world view
Te Ao Tūroa	Aotearoa: The natural environment
Te Moananui	Oceania: The Pacific Ocean
Te Moana-nui-a-Kiwa	Aotearoa: The great ocean of Kiwa, the Pacific Ocean, Oceania
Te Reo Māori	Aotearoa: The Māori language
Te Taiao	Aotearoa: The living world, nature, the eco-sphere, planetary living systems including climate
Te Tiriti o Waitangi	Aotearoa: The Treaty of Waitangi - importantly the Te Reo Māori version of the Treaty - signed by the British Crown and Rangatira Māori (Māori chiefs, leaders), the founding document of Aotearoa New Zealand.
Te Vaka Atafaga	Tokelau: Tokelauan model of wellbeing
Tikanga	Aotearoa: Appropriate Māori customary practices and behaviours
Tino rangatiratanga	Aotearoa: Sovereignty, self-determination
Tohunga	Aotearoa: Healer, shaman
Tu Manako	Kuki Airani (Cook Islands): Mental and emotional wellbeing
Tūrangawaewae	Aotearoa: The land base; a place of belonging, standing and identity - A place to stand
Va'a mataeina'a	Tahiti: Form of living landscape design / customary management.
Vaerua	Kuki Airani (Cook Islands): Spiritual wellbeing
Vaka	Tokelau: Voyaging canoe
Va-fealoai	Samoa: Mutual respect
Vanua	Fiji: Land, territory, place. Land one is identified with, a confederation of clans

Va-tapuia	Samoa: Sacred space and sets of behavioural norms
Wâdé	New Caledonia (Koné): life force
Waiata	Aotearoa: Song/s
Wāhi Tapu	Wāhi Tapu
Wai	Aotearoa: Water, liquid
Wairuatanga	Aotearoa: Spirituality - the holistic wellbeing of an individual and the spiritual synergy of the collective with which an individual identifies
Waiora	Aotearoa: The total wellbeing of the individual and family, also health
Whakataukī	Aotearoa: Māori proverbs
Whakapapa	Aotearoa: Genealogy, lineage. Also the kinship of human and non-human encompassing the complex relations between people and the land
Whakamana	Aotearoa: Empowerment
Whānau	Aotearoa: Family, close kinship group
Whanaungatanga	Aotearoa: Sense of connection, relationships, the importance of the family
Whenua	Aotearoa: The earth, ground or land; also placenta

References

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