Integrated Climate Risk Assessment for Nauru

Summary Report Draft

Deloitte.

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Introduction

Purpose of this Summary Report

Deloitte assisted the CSIRO team to conduct a national scale climate change risk assessment for Nauru. The risk assessment has integrated climate hazards, its associated impacts on key sectors of Nauru and inherent vulnerability of these systems following a risk-based approach, consistent with international best practice approaches.

Separate **stand-alone reports** have been prepared to identify the:

- The *Assessment of Climate Hazards and Associated Sectoral Impacts for Nauru Under Current and Future Conditions* Report, conducted by CSIRO (hereafter referred to as the 'Hazard Report'), and
- The first draft of the *Nauru Climate Vulnerability Assessment*, conducted by the University of Melbourne (hereafter referred to as the 'Climate Vulnerability Report').

This Summary Report (**Integrated Climate Impact Vulnerability Risk Assessment (CIVRA) for Nauru Summary Report**) has incorporated the findings from the aforementioned reports, and presents a summary of the results of the climate change risk assessment for Nauru.

This report provides a short overview of the more detailed **Risk Assessment Technical Report** which presents the detailed followed in the risk assessment process, lists key climate change projections for Nauru considered in the risk assessment process, and presentation of the detailed risk profiles for key priority sectors/domains of Nauru.

For detailed risk profiles, refer to the **Risk Assessment Technical Report**.

For further detailed information on hazard, impacts, exposure and vulnerability, refer to the aforementioned **stand-alone reports**. .

Guiding principles

To develop a risk assessment that is fit-for purpose in the context of climate risk management and decision making in Nauru, eight guiding principles have been adopted. These principles will assist in developing a comprehensive risk assessment with Nauru at the centre, focusing on collaboration with key stakeholders, alignment with existing climate risk bodies of work and use the evidence-based data and best practice approaches.

1 User-centred

Provide the practical information on climate change risks needed to inform adaptation action plans of Nauru and communicate the information appropriately to stakeholders.

2 Evidence-based

Draw on the latest and best available evidence (including scientific research) about the implications of climate change for Nauru.

3 Integrated

Support the integration of climate change risk management into decision making across Nauru and inform future climate adaptation action.

4 Transparent

Undertake a transparent process that builds awareness of climate change risk and opportunity in the Nauru context for the government and broader community.

5 Collaborative

Meaningfully engage with relevant stakeholders to understand their priority risks and opportunities and views on adaptation action.

6 Complementarity

Complement other relevant national and international bodies of work on climate change risk and disaster resilience.

7 Adaptive

Provide a sound basis for future rounds of climate change risk assessments for Nauru and potentially provide an evidence base for future national scale climate change risk assessment.

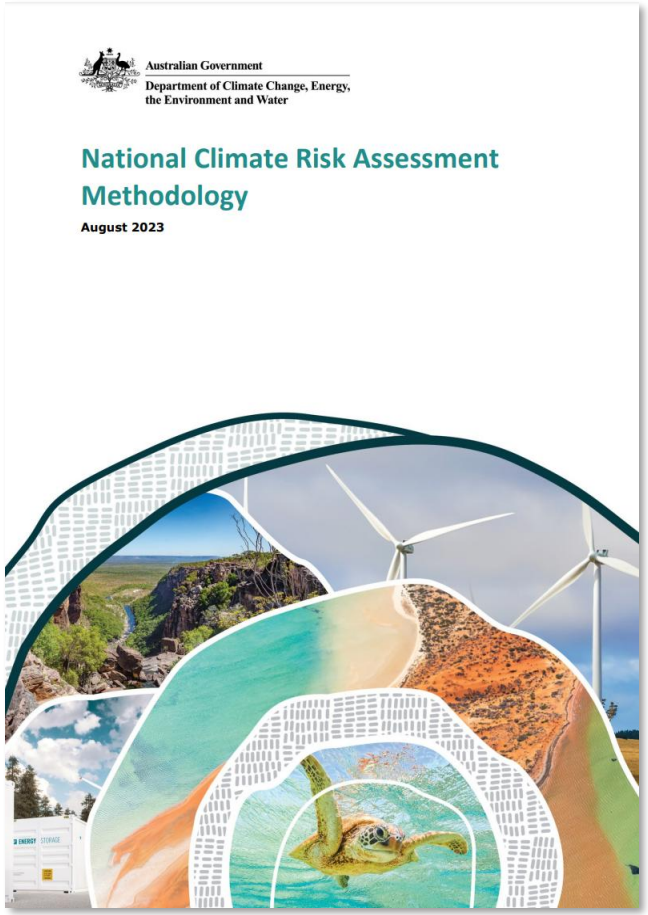
8 Leading and best practice approach

Align with leading practice standards and guidance on assessments including work of IPCC **(AR6)** on climate change risk assessments.

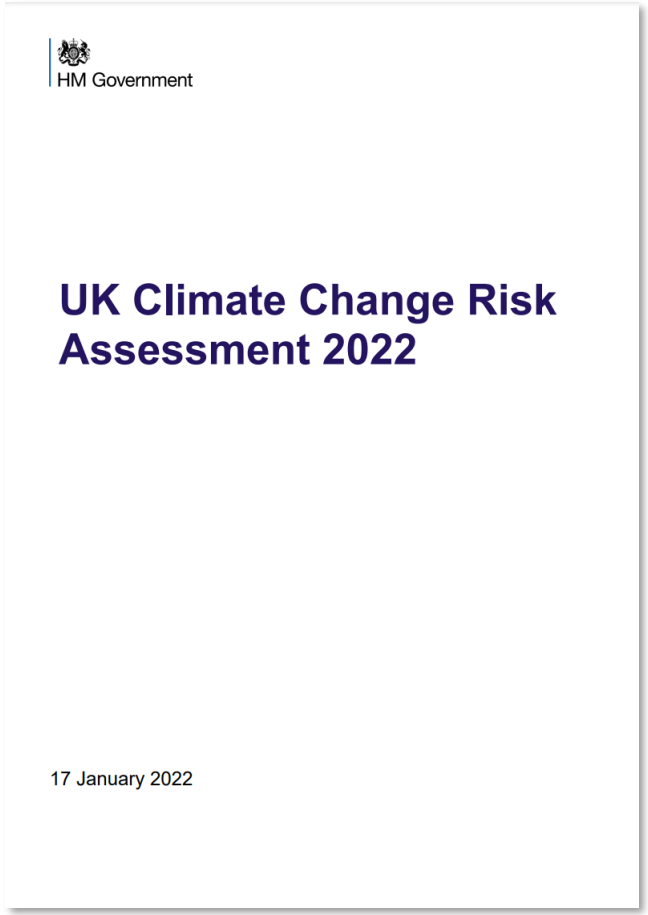
The climate risk framework and methodology

Introduction

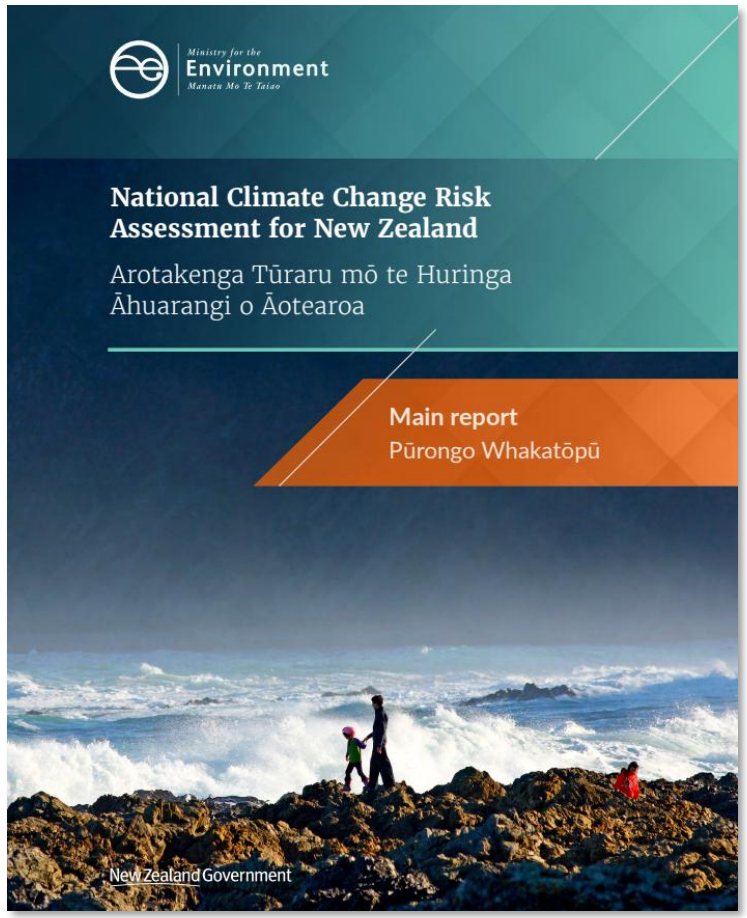
The climate change risk framework used for this project assessment is based on international leading practice for National scale climate change risk assessments, incorporating guidance from the Intergovernmental Panel on Climate Change (**IPCC, AR6**), Australia's National Climate Change Risk Assessment, UK Climate Change Risk Assessment, and New Zealand Climate Change Risk Assessment.



Australia



United Kingdom

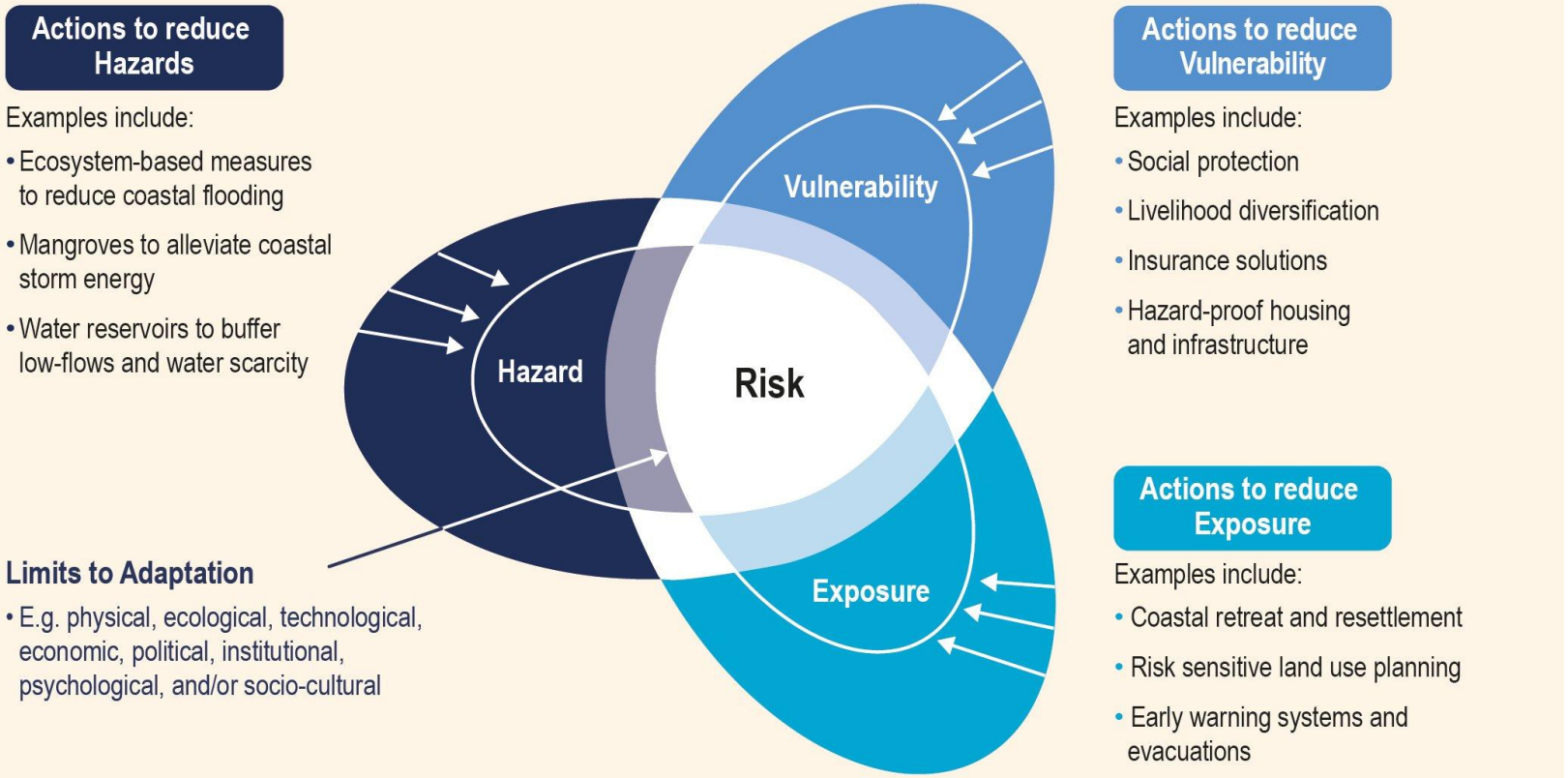


New Zealand

The risk assessment framework

The climate change risk framework defines risk as a function of a climate 'hazard', 'exposure' of a system to that hazard and any underlying 'vulnerabilities' of the system. To comprehensively assess climate risk in Nauru, this assessment considers the three components of risk.

This framework is presented by the following figure sourced from the IPCC AR6 (2022):



Three propellers show three key components of risk hazard, exposure and vulnerability) and arrows show examples of actions to reduce each component.

(Source: IPCC AR6)

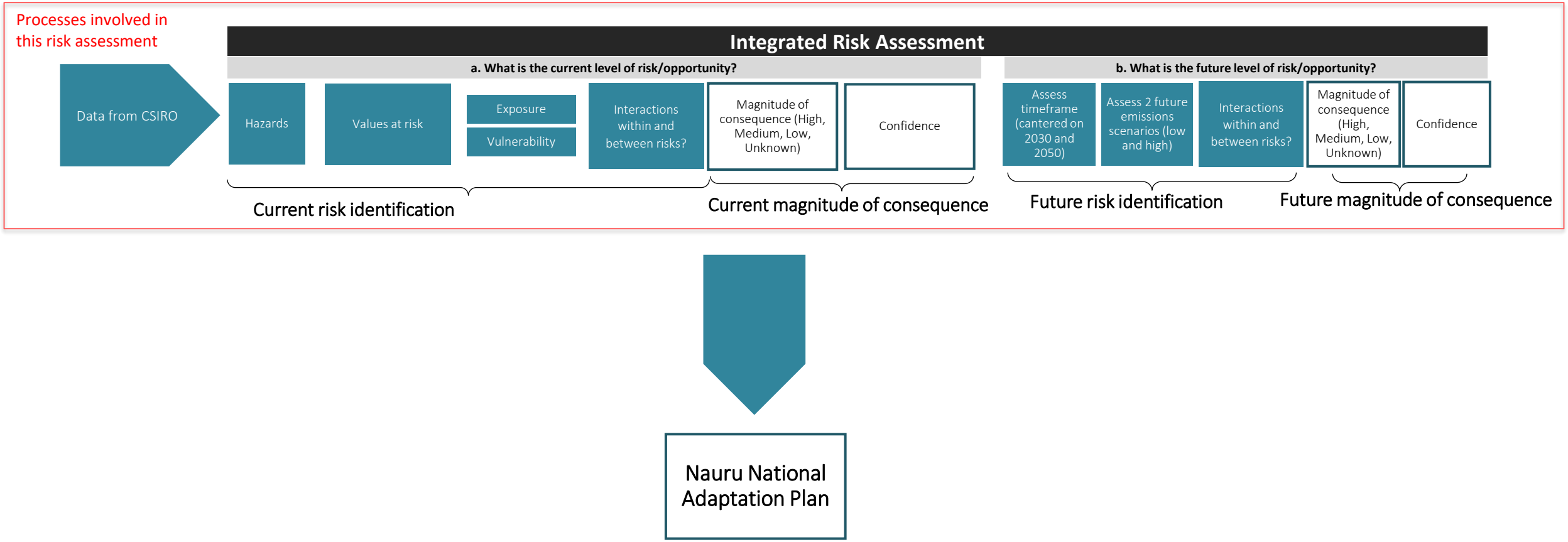
Key parameters

The risk assessment process was focused on key sectors a series of parameters and climate change scenarios, as shown below:

Risk assessment parameters	Adopted features
Hazard	Hazard and Impact Report
Sectors	The Nauru CIVRA has prioritised nine sectorswhich have been used to frame this risk assessment, as illustrated on page 11. In order to ensure the risk assessment for Nauru takes into consideration the unique perspectives and experiences of Nauru, the sectors used by this risk assessment were informed by, and aligned to, the Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (**RoNAdapt**). This was to ensure consistency with the existing framework used in Nauru to prioritize adaptation decisions.
Exposure	Assessment of exposure assessment were conducted by University of Melbourne and NGIS.
Vulnerability	• The RoNAdapt, and • Climate Vulnerability Report
Scale	National scale for Nauru.

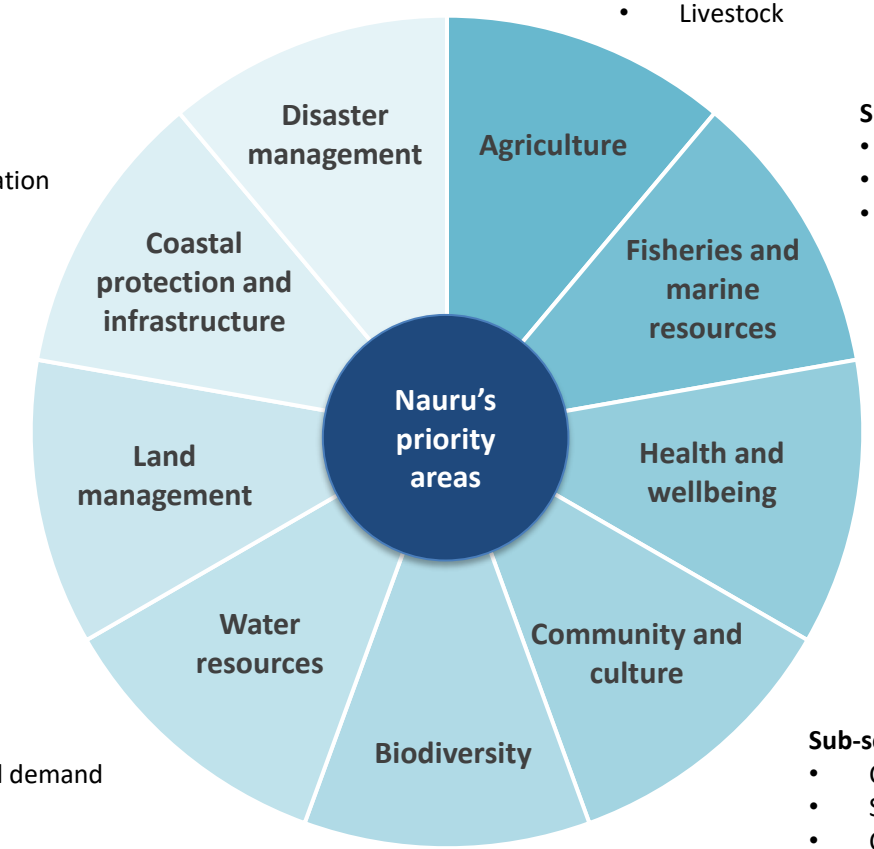
The risk assessment methodology

The integrated climate risk assessment covered in this report is the first step in the Nauru National Adaptation Plan (**NAP**). The Nauru NAP is being developed separately, with input from the findings of this assessment. The following figure provides a high-level overview of the methodology involved in this risk assessment, with further detail available in the technical report.



Nauru’s priority sectors

Aligning with the Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (**RoNAdapt**), the Nauru CIVRA has prioritised the following nine sectors for the risk assessment. Sub-sectors are listed as dot points.



Sub-sector at risk
- Emergency services

Sub-sector at risk
- Crops
- Livestock

Sub-sector at risk
- Coastal assets
- Internet and telecommunication
- Transport and supply
- Buildings and structures
- Energy security
- Waste management

Sub-sector at risk
- Oceanic fisheries
- Coastal fisheries
- Aquaculture

Sub-sector at risk
- Land use
- Higher Ground Initiative

Sub-sector at risk
- Public health
- Nauruan workforce

Sub-sector at risk
- Water availability and demand
- Water quality
- Water infrastructure

Sub-sector at risk
- Culture
- Social cohesion
- Community development

Sub-sector at risk
- Aquatic and coastal biodiversity
- Terrestrial biodiversity

Risk assessment criteria

Consequence score

The dominant hazard for each sub-sector is assigned a magnitude of consequence rating according to the process overview shown below. This rating is based on criteria adapted from international climate change risk assessments and further customised for Nauru. Different sectors have different levels of sensitivity and vulnerability for a given hazard, as a result so different sectors may have different consequence ratings for the same dominant hazard. For example, the water resources sector is currently more sensitive to drought than terrestrial biodiversity, resulting in a higher current-day consequence rating.

Detailed risk profiles for each sector are available in the Risk Assessment Technical Report. These profiles delve further into the present-day and future hazards, exposure, vulnerability and risk variations, as well as the emissions variation, to identify dominant hazards for each sub-sector and inform the consequence scoring process. Refer to pages 14-16 for the consequence criteria applied.

Note that consequences are different to impacts. Consequences consider how the impacts of climate hazards will affect the sector/sub-sector. For example, an *impact* of marine heatwaves is physical damage to marine habitat, with the *consequence* of reduced fisheries revenue for Nauru.

Overview of the scoring process

Using detailed risk profiles, determine and assess the most dominant climate hazard for each sub-sector based on how the hazard, exposure and vulnerability contribute to observed impacts and future risks.

Using the consequence criteria (see following pages) rate the consequence for the dominant climate hazard for each sub-sector/domain for current, 2030 and 2050 for the SSP5-8.5 scenario.

Ask a question: Will this 'rating' change under a low emission scenario SSP1-2.6?

If yes, record new rating for 2050 under low emission scenario.

Consequence criteria

The magnitude of consequence scoring criteria used in this assessment is shown below:

Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
Very minor consequences which can be handled through business-as-usual processes; or some minor region-specific impacts requiring no specialised management or intervention.	Some minor consequences across the island that could be addressed through local or regional management and adaptation processes. Consequences are short-term, not permanent and entirely reversible	Significant consequences across the island that may require intervention by the Nauru Government. Consequences are moderate, but reversible with appropriate interventions.	Major consequences across the island requiring intervention by the Nauru Government. Consequences are long-term but reversible with significant intervention. May be of interest to Nauru's international partners.	Extreme consequences across the island that requires urgent intervention by the Nauru Government. Consequences are permanent and irreversible. Consequences may completely compromise the system. May be of interest to Nauru's international partners.

Consequence criteria (cont.)

Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
• *Insignificant infrastructure disruption to utility services (i.e., water, electricity and telecommunication) and road infrastructure.* • *No discernible changes to health and wellbeing, including housing.* • *Negligible damage to commercial, health and residential buildings not requiring repair or relocation.*	• *Isolated and short-term infrastructure service disruption to utility services (i.e., water, electricity and telecommunication) and road infrastructure.* • *Limited to no impact on health and wellbeing outcomes.* • *Some minor restoration work required to commercial, health and residential buildings.*	• *Many short-term infrastructure service disruptions; disruption recoverable by maintenance and minor repair.* • *Moderate lasting impacts on health, safety and wellbeing, social welfare and housing of community members.* • *Damage recoverable by maintenance and minor repair to commercial, health and residential buildings. Some buildings require immediate relocation and assessment.*	• *Widespread short-to-medium term disruptions to utility services (i.e., water, electricity and telecommunication) and road infrastructure.* • *Prolonged disruption to health, safety and wellbeing, social welfare and housing of community members.* • *Extensive infrastructure damage requiring major repair to commercial, health and residential buildings. Considerable number of buildings need to be immediately relocated.*	• *Widespread, long-term service disruption; significant permanent damage and/or complete loss to utility services (i.e., water, electricity and telecommunication) and road infrastructure.* • *Health, safety and wellbeing, social welfare and housing of community members is significantly compromised across the region.* • *Severe and often irreparable infrastructure damage to commercial, health and residential buildings. Substantial number of buildings need to be immediately relocated.*

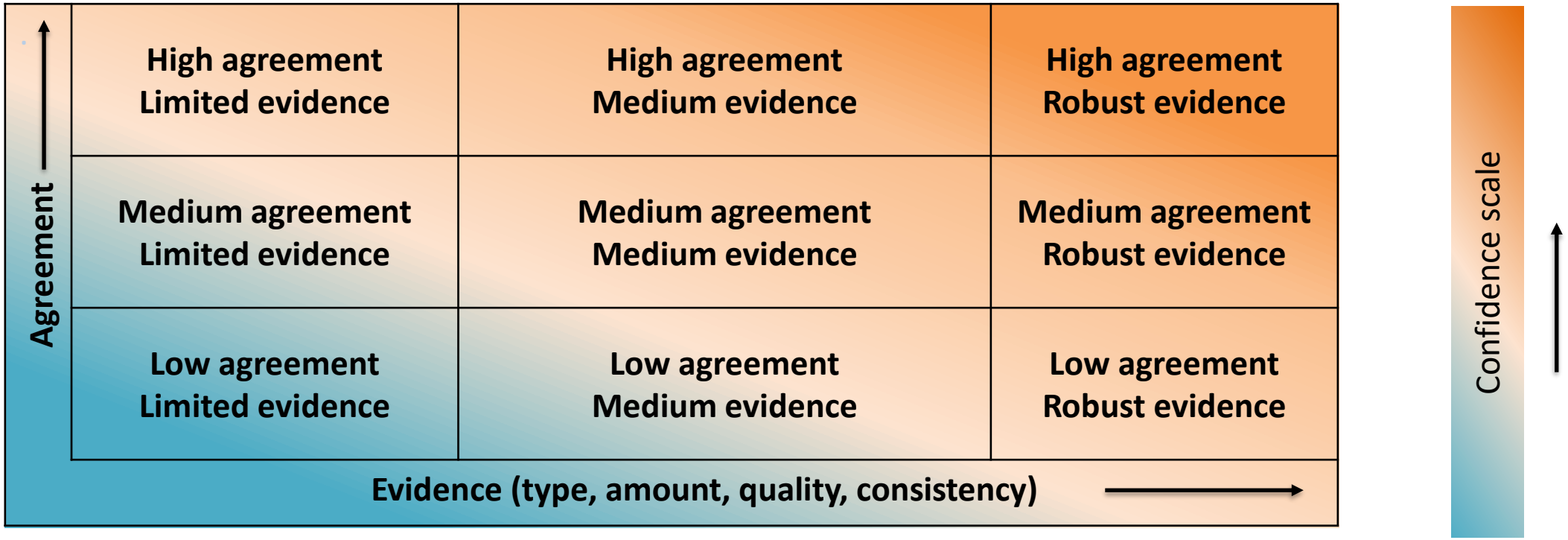
Consequence criteria (cont.)

Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)
• *Negligible or no disruptions to education, employment and/or community services.* • *Negligible impact on natural land and coastal areas.* • *Indistinguishable impacts to ecosystems and/or on quality and availability of water resources.* • *Inconsequential impacts to fisheries and/or agriculture.*	• *Minor disruptions to education, employment and/or community services.* • *Short-term and minor impacts to a small minority of land and coastal areas.* • *Temporary localised or minor effects on ecosystems and/or species and quality and availability of water resources.* • *Short-term, isolated reductions in the productivity and profitability of agriculture and fisheries*	• *Moderate disruption to education, employment and/or community services.* • *Regional/medium term reduction in the integrity/stability of most of coastal areas.* • *Sustained localised or shorter-term regional effects on ecosystems and/or the quality and availability of water resources.* • *Medium-term reductions in the productivity and profitability of fisheries and/or agriculture sector.*	• *Prolonged disruption to education, employment and community services; widespread and moderate impacts on social cohesion.* • *Major/longer-term reduction in the integrity/stability of most of coastal areas.* • *Longer-term and widespread impacts to ecosystems and/or water quality and availability.* • *Widespread, significant and prolonged impacts to fisheries and/or agriculture sector requiring significant structural adjustment.*	• *Widespread, long-term disruption to education, employment and community services.* • *Severe and widespread instability in coastal areas.* • *Widespread and long-term impacts that have compromised ecosystems and/or the quality and availability of water resources.* • *Failure of the fisheries and/or agriculture sectors.*

Confidence score and criteria

A confidence score was assigned to each risk statement, taking into account the strength of the supporting evidence that is currently available for the risks assessed. The criteria for confidence in the risk score is taken by the degree of agreement amongst the evidence and the type, amount, quality and consistency of the evidence. This aligns with IPCC guidance.

A depiction of evidence and agreement statements and their relationship to confidence is shown below. Confidence increases towards the top-right corner as suggested by the shading turning orange. Generally, evidence is most robust when there are multiple, consistent and independent lines of high-quality evidence.



Source: *IPCC Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties. 2010. https://www.ipcc.ch/site/assets/uploads/2017/08/AR5_Uncertainty_Guidance_Note.pdf*

Climate change in Nauru

Hazards assessment

The following table of climate projections for Nauru is sourced from the **2024 CSIRO Hazard Report** (*Assessment of Climate Hazards and Associated Sectoral Impacts for Nauru Under Current and Future Conditions*) and illustrates historical climate data and projected climate change for 20-year period centred on 2030 and 2050, relative to the baseline (20 years centered on 2005). These projections are based on simulations from CMIP6 global climate models (GCMs) for low (SSP1-2.6) and high (SSP5-8.5) emissions scenarios. Uncertainty ranges are shown in brackets.

Nauru		**Projected change**			
20-years centred on 2005		**2030**	**2050**	**2050**	
		Low/High Emissions*	**Low emissions**	**High emissions**	**Confidence**
	ATMOSPHERIC VARIABLES				
28.0 °C	Annual average temperature (°C)	+0.7 (0.3-1.3)	+1.0 (0.9-1.2)	+1.5 (1.2-2.0)	high
15 (6 to 34) days	Annual hot days (days > 32 °C) [a]	N/A	+120 (44 to 169)	+193 (69 to 242)	high
2100 mm	Annual average rainfall (%)	+11 (-19 to +39)	+13 (-1 to +52)	+24 (-6 to +63)	medium
105 mm/day	Annual maximum daily rainfall (mm/day)	N/A	+48	+54	medium
3 (0 to 5) events per 20 years	Average drought frequency (%) [d]	-33 (-77 to +100) %	-33 (-77 to +67) %	0 (-73 to +107) %	medium

a number of days over the 95th percentile of 1995-2014 daily temperatures
b Future values are reported, not changes.
c Exceed coral bleaching Alert level 2.
d Further information on projections for drought intensity, frequency and duration can be found in Chapter 7 of the 2024 CSIRO Hazard Report
* Little difference between low and high emissions at 2030

Table Source: CSIRO Hazard Report (2024).

Hazard Assessment (cont.)

The following table of climate projections for Nauru is sourced from the **2024 CSIRO Hazard Report** (*Assessment of Climate Hazards and Associated Sectoral Impacts for Nauru Under Current and Future Conditions*) and illustrates historical climate data and projected climate change for 20-year period centred on 2030 and 2050, relative to the baseline (20 years centered on 2005). These projections are based on simulations from CMIP6 global climate models (GCMs) for low (SSP1-2.6) and high (SSP5-8.5) emissions scenarios. Uncertainty ranges are shown in brackets.

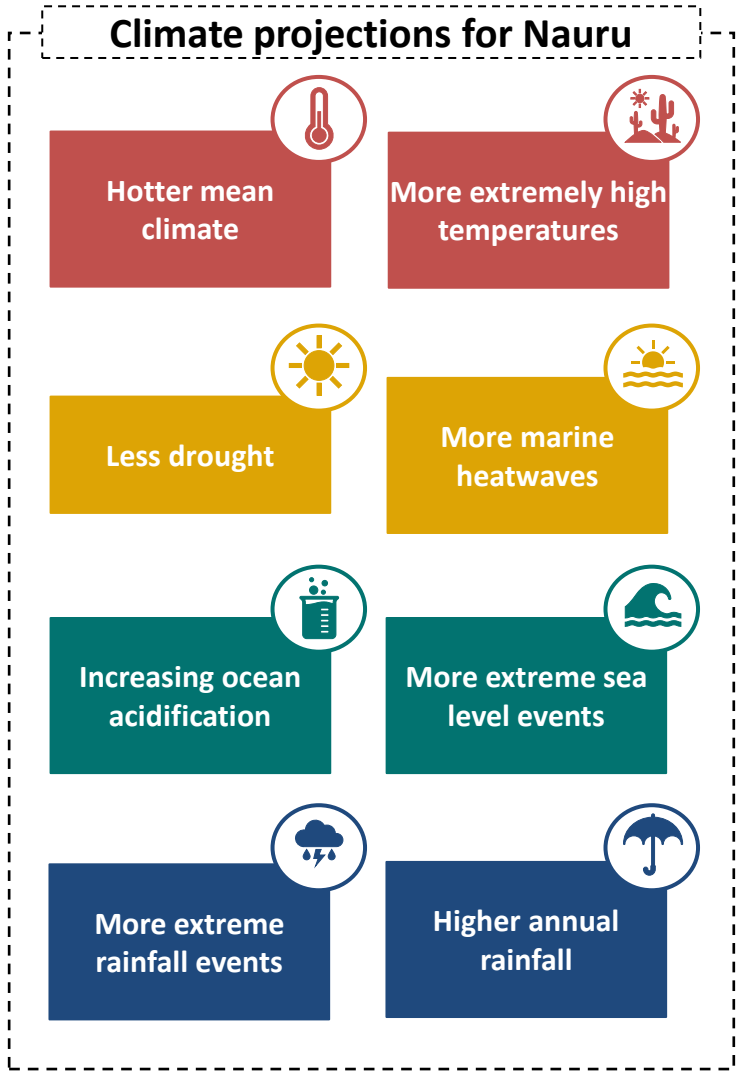
Nauru		**Projected change**			
20-years centred on 2005		**2030 Low/High Emissions***	**2050 Low emissions**	**2050 High emissions**	**Confidence**
	OCEAN VARIABLES				
0	Annual average sea level (cm)	+10 (7-14)	+21 (15-28)	+25 (19-33)	high
28.6 °C	Sea surface temperature (°C) over EEZ	+0.2 (-1.5 to +1.6)	+0.5 (-1.2 to +2.0)	+1.0 (-0.9 to +2.3)	high
16 days per year	Marine heatwave frequency (days/year) [b]	N/A	+105 to 140	+180 to 270	high
6.3 days per year	Degree heating weeks (ave days per year) [c]	N/A	+92 to 236	+107 to 344	high
8.04	Annual average ocean pH over EEZ[e]	8.00 (7.96 to 8.05)	7.97 (7.92 to 8.02)	7.92 (7.87 to 7.98)	high
3.8	Annual average aragonite saturation[e]	3.7 (3.3 to 4.0)	3.5 (3.1 to 3.98)	3.2 (2.8 to 3.7)	high

b Future values are reported, not changes.
c Exceed coral bleaching Alert level 2.
e Future values shown, not changes compared to historical.
* Little difference between low and high emissions at 2030

Table Source: CSIRO Hazard Report (2024).

Projected climatic changes and associated impacts in Nauru

Below is a summary of the potential impacts associated with the climate projections for Nauru:



Higher temperatures and increased heatwave intensity, duration and frequency

- Increasing water demand, heat stress in livestock (e.g., pigs and chickens).
- Heat-related illness, loss of workforce productivity and impacted health and wellbeing of community
- Power outages, damage to infrastructure, increased maintenance requirements, of essential services

Drought and water scarcity

- Freshwater storage capacity and functionality is limited in Nauru, and there are limits to the supply of desalinated water (RO) due to inefficient delivery systems. In addition, the groundwater system is not of an adequate standard for potable consumption due to salinity and pollution issues. Despite projected increasing rainfall and reducing drought, increasing security of water supply and quality remain critical actions for Nauru, particularly given projected increasing temperatures.

More extreme rainfall and higher annual rainfall

- Reduced water quality, increased pollution, and increased water-borne diseases due to localised flooding and water pooling
- Damage to infrastructure, loss of power and connectivity, increased demand for emergency services
- Reduced road access

More ocean acidification

- Reduced integrity of calcifying organisms
- Damage to marine infrastructure

Increased sea surface temperature

- Coral bleaching and damage to coastal and oceanic marine habitats
- Sea surface temperatures (SSTs) significantly affect fisheries, with variability of fish stock affected by the El Niño southern Oscillation (ENSO). During El Niño events, for example, fish follow warm water into the central Pacific, so higher purse-seine catches occur near Nauru. In future, overall increases to SST may also affect commercial and subsistence catches due to shifting fisheries' locations.

More extreme sea level events and coastal inundation

- Contamination of freshwater lens and potential damage to water infrastructure
- Threats to physical safety, mental stress
- Reduced land for agriculture, damage to terrestrial fauna and flora
- Damage to property and infrastructure, increased demand for emergency services

Current and future climate hazard ratings

The following two slides show the assessment of impacts based on current and future climate hazards for 2030 (when low and high emissions pathways are similar) and 2050 (when low and high emissions pathways are different), noting current vulnerability and exposure. Colours are aligned to the consequence rating scale below. SST is sea surface temperature and MHW is marine heatwave. Refer to Chapter 2 of the 2024 CSIRO Hazard Report.

Low	Medium	High	Very high	Extreme	Very Extreme	Unclear / no data

Sector	Current vulnerability and exposure	Current hazard ratings	Climate hazard ratings		
			2030	2050	
			Low/High	Low	High
Water resources	Water demand increases under extreme heat conditions	Extreme temperature			
	Saltwater contamination of freshwater lens increases demand for desalination. Water infrastructure can be damaged by coastal inundation.	Extreme sea level			
	Pressure on water delivery truck network and groundwater resources. Greater demand for desalination.	Drought*			
	Floods can damage to water supply/drainage infrastructure, and increased pollution/sediment can reduce water quality.	Extreme rainfall	No data		
		Extreme sea level			
	Limited ability to capture water in household water tanks	Rainfall			
Health and wellbeing	Heat stress and associated health and mental-health issues due to inadequate cooling in buildings, exposure of outdoor workers and heat-related power outages	Extreme temperature			
	Food safety and medical supply issues where refrigeration is limited				

Current and future climate hazard ratings (cont.)

Sector	Current vulnerability and exposure	Current hazard ratings	Climate hazard ratings		
			2030	2050	
			Low/High	Low	High
Health and wellbeing (cont.)	Flood-related water-borne disease and sanitation issues due to limited water treatment and sewage treatment plants. Flood damage to hospital and disruption to health services.	Extreme rainfall	No data		
	High exposure of communities to inundation, loss, and damage in low lying coastal areas, affecting mental health	Extreme sea level			
	Exposure of health infrastructure to inundation, affecting health services				
Agriculture	Exposure of agriculture in low lying areas to coastal inundation and saltwater intrusion into soil	Extreme sea level			
	Livestock are vulnerable to heat stress. Reduced labour productivity when hot	Extreme temperature			
	Limited water for crops and livestock during droughts	Drought*			
	Crops are exposed to floods. Reduced farm access during floods.	Extreme rainfall	No data		
Fisheries and marine resources	Fish catch may increase/ or decline depending on rate of SST warming/ emission scenario. National revenue is strongly dependent on offshore fish catches and licences	SST	unclear		
	Household consumption is strongly dependent on inshore fisheries productivity and marine biodiversity	SST			
	Maritime safety and fishing activity for coastal fishers can be affected by high winds / waves	Wind speed			
	Fish being processed may spoil in the heat without refrigeration, affecting potential sale value and suitability for consumption. Working conditions affected by high temperatures.	Extreme temperature			
	Pollution and sediments degrade coastal water quality	Extreme rainfall	No data		

Current and future climate hazard ratings (cont.)

Sector	Current vulnerability and exposure	Current hazard ratings	Climate hazard ratings		
			2030	2050	
			Low/High	Low	High
Disaster management and emergency response	Lack of property protection from extreme sea level and extreme rainfall elevates disaster risk	Extreme sea level			
		Extreme rainfall	No data		
	Black-outs can cause cascading and compounding impacts across multiple sectors which increase demand for emergency services	Extreme temperature			
	Increased risk of fire – resulting in the requirement for increased firefighting capacity. As there is limited water storage on Nauru, fire-fighting capacity is also limited.				
	Exposure to coastal inundation in low lying areas affects essential infrastructure	Extreme sea level			
	Flood damage to roads, airport, water, energy, and telecommunication facilities can disrupt emergency services	Extreme rainfall	No data		
Infrastructure and coastal protection (including transport energy, waste management, telecommunication)	Roads and airport runway are exposed to coastal inundation/erosion, flooding, and heat-related deterioration. Flooding may cause increased runoff / pollution to the sea	Extreme sea level			
		Extreme rainfall	No data		
		Extreme temperature			
	Telecommunication, building and coastal protection assets subject to surface flooding, coastal inundation, and groundwater intrusion	Extreme rainfall	No data		
		Extreme sea level			
	Electricity assets subject to surface flooding, coastal inundation, and groundwater intrusion	Extreme sea level			
		Extreme rainfall	No data		
	Increased energy demand and black-out risk on hot days	Extreme temperature			
	Salt spray may affect transmission wires	Drought*			
		Wind speed			

Current and future climate hazard ratings (cont.)

Sector	Current vulnerability and exposure	Current hazard ratings	Climate hazard ratings		
			2030	2050	
			Low/High	Low	High
Biodiversity and environment	Heat stress for some animals and plants. Sea turtle gender affected by sand temperature.	Extreme temperature			
	Declining health of coastal marine habitat such as coral reefs and lagoons	MHW and ocean acidification			
Land rehabilitation and land management	Rehabilitation areas are exposed to coastal inundation and erosion	Extreme sea level			
	Heat stress for workers	Extreme temperature			
	Rehabilitation sites may be susceptible to flood damage	Extreme rainfall	No data		
	Lack of access to water for building construction	Drought*			
Community and culture	Reduced labour productivity in hot conditions	Extreme temperature			
	Rehabilitation sites may be susceptible to flood damage	Extreme rainfall	No data		
	Population and gardens are vulnerable to dry conditions	Drought*			
	Heat stress for community and workers	Extreme temperature			
	Disruption for people at school or university.	Extreme rainfall	No data		
	Success of kitchen gardens affected by water availability and cost of desalinated water.	Drought*			
	Community disruption, especially at spring and king tides.	Extreme sea level			

Summary of the risk assessment results

Future magnitude of consequence score for Nauru's 2024 Risk Assessment

The risk assessment process is applied using climate change projections for Nauru to understand key risks for different sectors/domains. The below table presents the summary consequence ratings for key sectors/domains across different timeframes for Nauru. Each sector/domain is divided into key sub-sectors/sub-domains that are relevant for Nauru. A dominant hazard for the sub-sector/sub-domain is determined and assessed using hazard, exposure and vulnerability inputs from the CSIRO Hazard Report and University of Melbourne Vulnerability Assessment. The consequence for each timeframe and emission scenario are then scored using the magnitude of consequence criteria (pages 14-16). Different sectors have different levels of sensitivity and vulnerability for a given hazard, as a result different sectors may have different consequence ratings for the same dominant hazard. For example, the water resources sector is currently more sensitive to drought than terrestrial biodiversity, resulting in a higher current-day consequence rating. This consequences table is different to Table 03 in the Hazards Report as it only considers the dominant hazard for each sub-sector and considers consequences, not impacts. Consequences consider how the impacts of climate hazards will affect the sector/sub-sector. For example, an impact of marine heatwaves is damage to critical marine habitat, with the consequence of reduced fisheries revenue for Nauru. For discussion of all climate hazard impacts for each sector, see the technical report.

Sector/domain	Sub-systems being assessed *Sub-sector/sub-domain*	Key climate drivers and associated impacts	Baseline *Current*	Future magnitude of consequence score 2030 Low/ high emissions	 2050 Low emissions	 2050 High emissions
Water resources	Water availability and demand	Increased annual **rainfall** is likely to increase water supply if delivery and storage infrastructure is maintained and improved. However, water demand is likely to increase with a larger population living under more extreme temperature conditions. Therefore, while drought may occur less frequently, water availability will still be limited during these times, affecting community health, industry and agricultural production.	Major	Major	Major	Major
	Water quality	Extreme **rainfall** can cause flooding and pollution (including sewage, industrial, domestic, and mining waste) to enter ground and surface water catchments. This occurs when drainage, septic and water storage systems are overwhelmed. Poor water quality affects community and ecosystem health.	Moderate	Moderate	Major	Major
	Water infrastructure	Water infrastructure is damaged through saline intrusion, erosion and sediment movement from **sea level rise** and coastal inundation, and extreme rainfall related flooding.	Moderate	Moderate	Major	Major

Future magnitude of consequence score for Nauru's 2024 Risk Assessment Cont.

Sector/domain	Sub-systems being assessed	Key climate drivers and associated impacts	Baseline	Future magnitude of consequence score		
	Sub-sector/sub-domain		*Current*	2030 Low/ high emissions	2050 Low emissions	2050 High emissions
Health and wellbeing	Public health	**Heat-related** illnesses will continue to affect more people, including increasing electricity demand for refrigeration and cooling. Conditions will be more favourable for food-borne disease, infectious, and vector-borne diseases, placing pressure on public health services, threatening community health and increasing economic costs.	Moderate	Moderate	Major	Extreme
		While Nauru has low rates of diarrheal disease (potentially due to the reliance on desalinated water), water-borne diseases and enteric infections are still prevalent, particularly after **heavy rainfall**, which can be exacerbated by a lack of maintenance of rainwater tanks, poor drainage, and overflow of septic systems.	Moderate	Major	Extreme	Extreme
	Nauruan workforce	**Heatwaves** and hot days can reduce workforce productivity with major effects on the economy, business continuity, water security, food security, infrastructure development, and both physical and mental health.	Moderate	Moderate	Major	Major
Agriculture	Crops	Saline intrusion and extreme sea level events may encroach on arable land and reduce soil quality, affecting crop productivity and cultural practices in Nauru	Moderate	Moderate	Moderate	Major
		Increased **annual-average rainfall** will increase fresh-water access if delivery and storage infrastructure is maintained and improved. However, demand for water resources is likely to increase with higher evaporation due to more extreme temperature conditions. Therefore, while drought may occur less frequently, water availability will still be limited when drought occurs, affecting crop production.	Moderate	Moderate	Major	Major
	Livestock	Increased **annual-average rainfall** will increase fresh-water supply if delivery and storage infrastructure is maintained and improved. However, livestock demand for water resources is likely to increase under more extreme temperature conditions. Therefore, while **drought** may occur less frequently, water availability will still be limited when drought occurs, affecting livestock production.	Moderate	Moderate	Major	Major

Future magnitude of consequence score for Nauru's 2024 Risk Assessment Cont.

Sector/domain	Sub-systems being assessed *Sub-sector/sub-domain*	Key climate drivers and associated impacts	Baseline *Current*	Future magnitude of consequence score 2030 Low/ high emissions	 2050 Low emissions	 2050 High emissions
Fisheries and marine resources	Oceanic fisheries	**Increases in SST** will displace tuna fishing grounds, affecting the availability of tuna species that support the Nauru economy through fishing access fees, with consequences for the provision of essential services and community wellbeing.	Minor	Moderate	Moderate	Major
	Coastal fisheries	**Marine heatwaves** and associated coral bleaching will compound the impacts of overfishing, reducing the resilience of coastal fish stocks and reef ecosystems, with negative consequences for the food security and livelihoods of Nauruans. Extreme rainfall may increase pollution run-off into coastal waters	Moderate	Major	Major	Extreme
	Aquaculture	Increased **average and extreme rainfall** will increase runoff (and potential pollution) to Buada Lagoon. While **droughts** may occur less frequently, evaporation is likely to be higher due to more extreme temperatures, potentially increasing lagoon salinity levels. During droughts therefore the ability to farm milkfish may be negatively impacted.	Moderate	Moderate	Major	Major
Disaster management	Emergency services	Worsening c**oastal inundation, extreme rainfall, high temperatures, fire-risk** and high community vulnerability to natural disasters threatens emergency response infrastructure. This places significant pressure on emergency services to protect human health, property, infrastructure, and livelihoods.	Moderate	Moderate	Moderate	Major
Coastal protection and infrastructure	Coastal assets and flood defenses	Wave energy can damage and destroy sea walls, creating debris and exposing some communities and infrastructure to extreme sea level related coastal inundation and coastal erosion.	Moderate	Moderate	Major	Major
	Fisheries infrastructure	Wave energy from large swells can damage fishing infrastructure and equipment	Minor	Minor	Moderate	Moderate
	Internet and telecommunications	ICT connectivity in Nauru is disrupted **by flooding** and clouds which interrupt satellite connections and damage ICT infrastructure, affecting provision of essential services, such as education, health care and disaster risk management (including early warning systems), economic development and community wellbeing.	Moderate	Moderate	Moderate	Moderate
	Transport and supply chains	Coastal **inundatio**n from king tides and storm surge	Moderate	Moderate	Major	Major

Future magnitude of consequence score for Nauru's 2024 Risk Assessment Cont.

Sector/domain	Sub-systems being assessed	Key climate drivers and associated impacts	Baseline	Future magnitude of consequence score		
	Sub-sector/sub-domain		*Current*	2030 Low/ high emissions	2050 Low emissions	2050 High emissions
Coastal protection and infrastructure (cont.)	Energy	**Extreme heat** can disrupt power supply by causing transformers to overheat, inhibit critical maintenance, and increase electricity demand for air conditioners, refrigeration, and fans, with cascading impacts across a wide range of sectors and communities, including disrupting critical services (including health services, ICT connection and disaster response activities) and businesses.	Moderate	Moderate	Major	Major
	Buildings and structures	**Extreme sea level** and coastal inundation may impact buildings in some areas	Moderate	Moderate	Moderate	Major
	Health infrastructure	Health care facilities are in low-lying areas, making them vulnerable to direct damage and disruptions to critical infrastructure, accessibility, and supply chains during **floods**, with major consequences for community health, disaster response activities and the provision of health services.	Moderate	Moderate	Major	Major
	Waste management	**Flooding** can impact drainage systems and cause septic tanks to overflow with significant impacts on water quality and community health.	Moderate	Moderate	Major	Major
Biodiversity and environment	Aquatic and coastal biodiversity	**Marine heatwaves** and **sea surface temperature** will cause coral bleaching (exacerbated by **ocean acidification**) and compound the impacts of overfishing to damage, deplete and reduce the resilience of aquatic and reef ecosystems with major consequences for the aquatic and coastal biodiversity of Nauru.	Moderate	Major	Major	Extreme
	Terrestrial biodiversity	While **drought** may occur less frequently, plant water use is likely to increase under more **extreme temperature** conditions and higher evaporative demand. Therefore, when drought does occur, terrestrial biodiversity will be more adversely affected, resulting in the depletion of important ecosystem services.	Moderate	Moderate	Major	Major
Land management and rehabilitation	Land use and rehabilitation	In future, increasing temperatures and extreme rainfall may make any land rehabilitation more difficult. Projected increases to average rainfall, along with fewer droughts, may improve options for any terrestrial biodiversity improvements and agricultural pursuits.	Moderate	Moderate	Major	Major
		Projected increases to **average rainfall**, along with **fewer droughts**, may improve options for any terrestrial biodiversity improvements and agricultural pursuits. When **droughts** occur, they will be experienced along with more extreme temperature conditions	Moderate	Moderate	Moderate	Major
Community and Culture	Community development	Heat stress due to **extreme temperatures** affect communities. Flooding due to **extreme rainfall,** and coastal inundation due to **extreme sea level** events, may impact cultural sites.	Moderate	Moderate	Major	Major

Risk statements and profiles

Risk Narratives for the Nauru Climate Change Risk Assessment

For each sector, a risk narrative has been developed that includes the risk statement and summarises the hazards the sector is exposed to, the impact of these hazards, vulnerability factors relevant to this sector, and key consequences for Nauru. Consequences consider how the impacts of climate hazards will affect the sector/sub-sector. For example, an *impact* of marine heatwaves is damage to critical marine habitat, with the *consequence* of reduced fisheries revenue for Nauru.

This summary is based on the detailed risk profile which informs dominant hazard identification and consequence scoring by delving further into the present-day and future hazards, exposure, vulnerability and impact variations, as well as the emissions variation, and can be found in the Technical Report. Each of the below sectors and narrative statements is explored in the following chapters of this Report.

Sector	Risk number	Risk Narrative title
Water resources	**R1**	Risks to water availability and demand, quality and infrastructure.
Health and wellbeing	**R2**	Risks to public health and the Nauruan workforce.
Agriculture	**R3**	Risks to crops and livestock.
Fisheries and marine resources	**R4**	Risks to commercial oceanic and coastal fisheries and aquaculture.
Disaster management	**R5**	Risks to emergency services.
Coastal protection and infrastructure	**R6**	Risks to coastal assets, internet and telecommunications, transport and supply, energy, buildings and structures, and waste management.
Biodiversity and environment	**R7**	Risks to aquatic, coastal and terrestrial flora and fauna.
Land management	**R8**	Risks to land use and rehabilitation.
Community and culture	**R9**	Risks to culture, social cohesion, community development.

Risk Narratives for the Nauru Climate Change Risk Assessment

Example risk narrative: Fisheries

Concise risk statement:

Chronic and acute climate hazards will increasingly impact the viability of oceanic and coastal fisheries and aquaculture, which are important for both economic and food security, and hold cultural significance in Nauru.

Hazards affecting this sector:

- Extreme temperature
- Drought
- Sea surface temperature, marine heatwaves, and ocean acidification
- Sea level rise, extreme sea level events and coastal inundation
- Extreme rainfall

Impacts on this sector:

- Damage to critical marine habitat reducing fish stocks
- Decreased sustainability of coastal fisheries
- Changing capacity for aquaculture
- Eastward shift relative to current position of oceanic fish stocks
- Potential fish spoilage
- Reduced resilience of reefs and coastal fisheries to runoff pollution, marine heatwaves, ocean acidification

Vulnerability factors relevant to this sector in Nauru:

- Some reliance on coastal resources for food security
- High reliance on fishing licences for national revenue
- Limited drainage facilities increase exposure to phosphate mining and run-off that affects coral reefs
- Overfishing has depleted coastal fish stocks, reducing fisheries resilience to climate hazards
- Lack of implementation and enforcement of traditional or legislative restrictions on coastal fishing

Consequence to Nauru:

- Significant loss of key revenue sources and livelihoods
- Increased food insecurity and flow-on effects for public health
- Loss of cultural practices

Introduction to the detailed climate risk profiles in the Technical Report

Below is an overview of the detailed climate risk profiles created using the inputs from the CIVRA workshops. These profiles are available in the Risk Assessment Technical Report. The purpose of the detailed risk profiles is to delve further into the present-day and future hazards, exposure, vulnerability and impact variations, as well as the emissions variation, to identify dominant hazards for each sub-sector/domain and inform the consequence scoring process.

Heading	Overview
Sector Summary	• Overview of the sector, including key components, and context in Nauru
Risk Statement	• Sector-specific risk narrative statement and summary of key climate impacts, vulnerabilities and consequences
Exposure to current and future hazards	• Establish key climate hazards impacting sector • Consider how the key components of the sector (for example, crops and livestock for agriculture) have already been impacted by these hazards • Consider future exposure and impacts of climate pressures on key components based on future hazard projections
Vulnerability	• Summarise the key sources of vulnerability relevant to the risk
Complex Risks	• Establish how the risk and its consequences is impacted by interaction with other climate risks/compounding factors
Consequence	• Determine the current consequences of dominant climate change hazard for the sector • Determine the future consequences of dominant climate change hazard for the sector under both scenarios for 2030 and 2050 (low and high emissions)
Confidence	• Describe the quality and amount of evidence supporting the risk assessment
Knowledge Gap	• Recognise information and data gaps

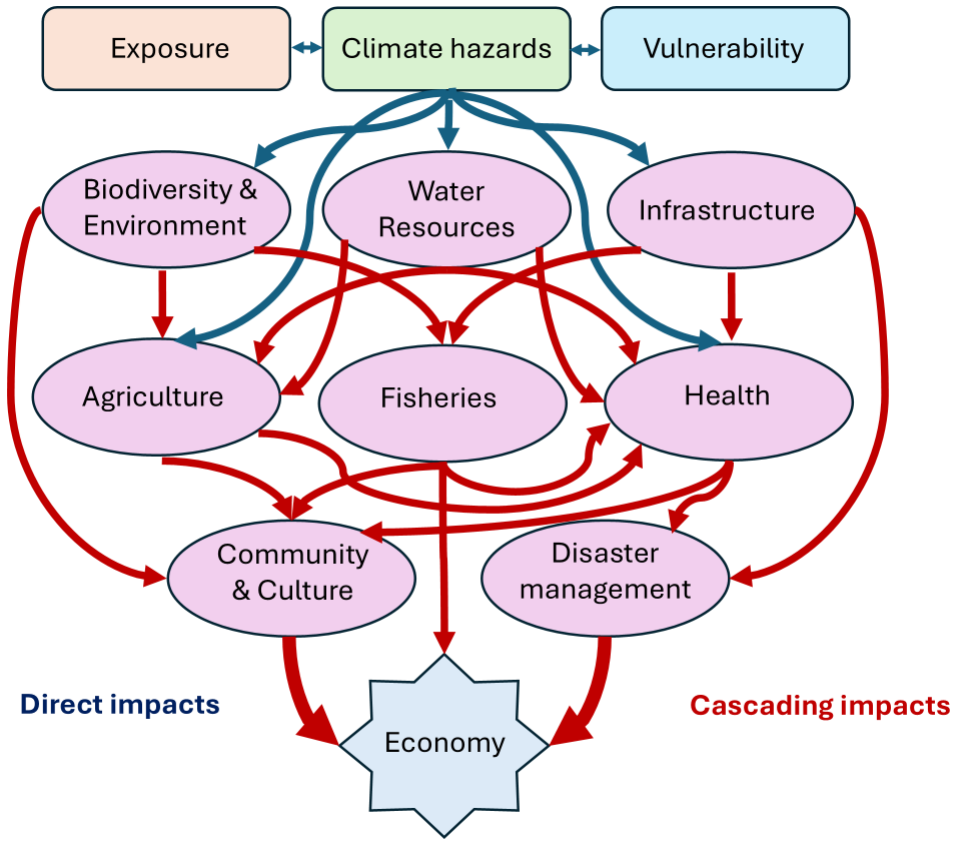
Introduction to complex climate change risks

What is complex risk?

Complex risk results from multiple climate hazards occurring concurrently, and from multiple risks interacting, compounding the overall risk and resulting in risks transmitting through interconnected systems and across regions. Understanding these risks is crucial for effective climate adaptation and resilience planning.

There are three categories of complex risks:

- **Aggregating risk:** Aggregation occurs when risks with unrelated causes – including those not directly related to the climate – occur simultaneously.
- **Compounding risk:** Risks that arise from the unilateral and/or bilateral interaction of hazards, which can be characterised by single extreme event or multiple coincident or sequential events that interact with exposed systems or sectors.
- **Cascading risk:** One event or trend triggering others; interactions can be one way (e.g., domino or contagion effects) but can also have feedbacks. Cascading risk is often associated with the vulnerability component of risk, such as critical infrastructure.



Risk transmission from climate hazards and interconnections between the nine sectors assessed for Nauru. Note this is an indicative high-level diagram and does not capture all possible connections.

Nauru complex climate change risks

How does this Risk Assessment consider complex climate change risks?

This Risk Assessment considers the connections between domains and risks at a high level, as demonstrated within the Risk Assessment Technical Report. Within each risk profile, there is individual and nuanced discussion regarding the most relevant complex risks. Within each risk profile in this report, there is individual and nuanced discussion regarding the most relevant complex risks. Complex risk results from multiple climate hazards occurring concurrently, and from multiple risks interacting, compounding the overall risk and resulting in risks transmitting through interconnected systems and across regions. For example, for the risks assessed to the Nauru biodiversity, the following interacting risks have been identified which can have significant consequences for community health and livelihoods in Nauru:

- Agriculture and fisheries: Loss of biodiversity and damage to ecosystems will reduce the productivity of agriculture, aquaculture, and fisheries with consequences for food security, livelihoods, and public health in Nauru.
- Infrastructure: Loss of ecosystem services, including coastal protection from reefs, shade provision, erosion control and salt spray protection, will affect coastal communities and infrastructure with implications for human safety and the provision of essential services.

The complex risks identified in the Nauru Risk Assessment are included at the end of each risk profile.

Sector/domain 1: Water resources

Water resources | Overview

Summary of water resources in Nauru

The main sources of potable water in Nauru are rainfall and reverse osmosis of seawater. Water delivery and storage is an issue, particularly during drought. Groundwater is used for washing and gardens but varies according to exposure to drought and local circumstances and community awareness about water quality risk.

There are three major subsectors in the Nauru water resources sector:

1. Water availability and demand
- RO and rainfall catchment water provides potable water.
- Water demand driven by weather conditions and population growth.
- Plans to develop piped water system.
- Groundwater use varies according to season and circumstances.

2. Water quality
- Groundwater quality is variable, depending on location and rainfall, can be saline and contaminated by sewage and mining waste.
- Condition of RO water delivery trucks and water tanks affects water quality.

3. Water infrastructure
- Six desalination units at two sites.
- Six water trucks to deliver water.
- Privately maintained household water tanks.
- Groundwater wells.

Water resources | Overview

Concise risk statement:
Chronic and acute climate hazards compounded with changing demographic profile and poor infrastructure will increasingly affect water security which is important for the public health, agricultural productivity, and environment of Nauru.

Hazards affecting this sector:
- Drought
- Extreme heat events
- Average rainfall and extreme rainfall events
- Sea level rise, extreme sea level events and coastal inundation

Impacts on this sector:
- Saline intrusion of groundwater
- Increased heat and evaporation increase water demand
- Ongoing reliance on de-salination to provide potable water
- Increasing cost of maintenance for water infrastructure
- Reduction of water table and increased reliance on saline groundwater during drought
- Projections indicate fewer droughts in future
- Damages to water pumps
- Sewage, industrial, domestic, and mining waste contaminates groundwater
- Potential increase in water availability with increased average rainfall

Vulnerability factors relevant to this sector in Nauru:
- There currently are too few delivery trucks to distribute water adequately, particularly in times of drought
- Limited water storage capability reduces water availability and quality especially during drought, with 64% households main water supply prone to drying up. Nearly three-quarters of all households reported that their water supply dries up, with 8.4% of households reporting that this occurs frequently
- Limited maintenance of water tanks and gutters
- Poor groundwater quality and no monitoring of groundwater resources to assess volume of extraction or salinity.

Vulnerability factors relevant to this sector in Nauru (cont.):
- Households are exposed to potential water quality issue at water collection points due to the quality of the exposed surface, contamination of the surface (for example, from phosphate dust), maintenance of water tanks and water tankers
- Increasing population is increasing demand for water resources
- Desalination is expensive in terms of energy consumption and needs expertise for its maintenance, with spare parts shipped from Australia
- *Escherichia coli* outbreaks are frequent due to degraded and variable quality of both groundwater extraction and septic systems
- Truck delivery requires road access, which is not available to a few properties in Nauru, particularly newer houses on informal roads
- Complete dependency on electricity from diesel generator for desalination increases vulnerability
- RO water used for firefighting due to saline groundwater affecting the pipes and pumps of the fire truck.

Consequence to Nauru:
- Increased annual rainfall will increase water supply if delivery and storage infrastructure is maintained and improved. However, water demand is likely to increase with a larger population living under more extreme temperature conditions. Therefore, while drought may occur less frequently, water availability will still be limited during these times, affecting community health, industry and agricultural production.
- Public health issues due to poor sanitation, low water quality and community stress
- Loss of vegetation during drought exacerbating loss of biodiversity
- Limitation to potential for agricultural productivity
- Inability to carry out water-intensive activities and disruption to RO supply, affecting water accessibility for consumption and firefighting

Water resources | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Complete dependency on electricity from diesel generator for desalination increases vulnerability to power outages during disasters • Increasing population is increasing demand for water resources • People are highly reliant on RO water, including for firefighting due to saline groundwater affecting the pipes and pumps of the fire truck • People with disabilities face accessibility issues when accessing water infrastructure and services • No monitoring of underground water resources to assess extraction or salinity • Groundwater in central part of Topside is particularly low quality, considered brackish at the surface and seawater quality at 20m • Proposed improvements for water reticulation and sanitation are currently unfunded
Average temperature and extreme temperature	• Extreme temperatures can strain Nauru's water sector by increasing evaporation rates, reducing rainwater collection, and intensifying water demand. Higher temperatures can also lower desalination efficiency, accelerate pipeline wear, and worsen saline intrusion into groundwater. These challenges further stress Nauru's limited water infrastructure, affecting supply reliability and community well-being.
Drought	• Limited water storage capability reduces water availability and quality especially during drought, with 64% households main water supply prone to drying up. Nearly three-quarters of all households reported that their water supply dries up, with 8.4 percent of households reporting that this occurs frequently Coastal plants, such as coconut and pandanus, are not resilient to extended periods of drought • There currently are too few delivery trucks to distribute water adequately in times of drought, with 48.6% of Nauruans depending on RO water supply from tanker trucks for drinking water • 22.7% of households report being able to use relatives' or neighbours' water resources during drought, reducing vulnerability • Roughly one third of households have no guttering with 15% of households in need of guttering repair, reducing ability to harvest rainwater • Limited maintenance of water tanks and gutters
Extreme rainfall and average rainfall	• Degraded and variable quality of both groundwater extraction and septic systems can increase exposure to *E. coli* outbreaks and other diseases. • Land-based pollution, mining run-off and sediment movement increases the vulnerability of water catchments and drains to flooding events • Poorly maintained gutters contribute to water pooling and potential breeding grounds for disease vectors such as mosquitos

Water availability, demand and quality | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Water availability and demand	Drought-induced water scarcity is causing significant declines in community health, outdoor worker productivity, and kitchen garden production.	**Major** • In the most recent 2023 census, 62.7% of households reported being affected by drought in the previous 10 years. • Poor groundwater quality and reliance on RO water for domestic use during drought increases vulnerability to prolonged dry periods. • Limited agricultural production is further reduced in drought due to the expense of RO water, with implications for access to nutritious food.	**Major** **Compound effect of drought and hotter climate** • The benefits of less frequent drought (compared to the baseline) may be offset by a hotter climate increasing water demand and contributing to water scarcity is causing significant declines in community health, productivity, and agricultural yield, whilst also reducing desalination plant efficiency and groundwater replenishment. • Physical and mental health of communities may be threatened by reduced water availability. • Potential agricultural productivity and biodiversity will be affected as even hardy species, such as pandanus, dieback	**Major** • The benefits of less frequent drought (compared to the baseline) may be offset by a hotter climate increasing water demand and contributing to water scarcity is causing significant declines in community health, productivity, and agricultural yield. • A hotter climate with more significant saline intrusion and higher population may worsen water security during periods of water scarcity. • Public health and agricultural productivity will be threatened as some communities turn to poor-quality groundwater for domestic and agricultural uses, threatening community health. • Projections for increased rainfall may reduce these effects improving water capacity provided there is sufficient and efficient water catchment capacity.	**Major** • The benefits of less frequent drought (compared to the baseline) may be offset by a hotter climate increasing water demand and contributing to water scarcity is causing significant declines in community health, productivity, and agricultural yield. • A hotter climate with more significant saline intrusion and higher population may worsen water security during periods of water scarcity. • Public health and agricultural productivity will be threatened as some communities turn to poor-quality groundwater for domestic and agricultural uses, threatening community health. • Projections for increased rainfall may reduce these effects improving water capacity provided there is sufficient and efficient water catchment capacity.	**Medium** Although high confidence in future impacts and consequences, confidence is reduced by uncertainty in the net impact of future drought, population growth, rising sea levels and increased rainfall

Water availability, demand and quality | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Water quality	**Extreme rainfall** Extreme rainfall can reduce water quality and threaten human health by overwhelming septic systems, water storage, treatment, and drainage infrastructure. It also washes land-based pollutants—such as sewage, industrial waste, domestic waste, and mining runoff—into groundwater and surface water catchments, increasing contamination risks.	**Moderate** • Extreme rainfall can result in poor water quality due to high sediment and pollution load in run off. • Cases of rotavirus for infants are linked to by playing in water/mud following heavy rainfall.	**Moderate** • Run-off and flooding during extreme rainfall events will reduce the water quality of surface and ground water catchments. • Water security and community health will both be affected with increasing risk of water-borne disease transmission.	**Major** • Significant increases in annual maximum daily rainfall (increase of 48 mm/day) will cause run-off, flooding and inundation that can pollute catchments and reduce water quality. • Damage to and overflow of septic systems and water storage, treatment and drainage systems may further impact water quality. • Human health may be threatened, with increasing risk of water-borne disease transmission.	**Major** • Significant increases in annual maximum daily rainfall (increase of 48 mm/day) will cause run-off, flooding and inundation that can pollute catchments and reduce water quality. • Damage to and overflow of septic systems and water storage, treatment and drainage systems may further impact water quality. • Human health may be threatened, with increasing risk of water-borne disease transmission.	**High** Strong strength of evidence only marginally reduced by lack of annual maximum daily rainfall (mm/day) projection for 2030

Water infrastructure | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Water infrastructure	**Coastal inundation from high spring tides and storm surges** Water infrastructure is damaged through saline intrusion, erosion and sediment movement from **sea level rise and coastal inundation**, and **extreme rainfall** related flooding.	**Moderate** • Water quality of reservoirs is declining with saltwater intrusion, driving greater reliance on desalination units. • Flooding can damage water tanks and wastewater infrastructure. • Significant impacts on water security, community health and agricultural productivity.	**Moderate** • More frequent coastal inundation will continue to increase the salinity of groundwater reservoirs and cause erosion and flooding that damages water infrastructure including water tanks, wastewater, and stormwater systems. • Increased risk of infections and waterborne diseases.	**Major** • Sea level rise of 15-28 cm will increase the frequency and severity of coastal inundation events. • The capture, storage and treatment of potable water and fresh groundwater may be disrupted. • Septic tanks and wastewater systems will be increasingly overwhelmed, causing sewage pollution. • Community access to clean water may be disrupted with severe consequences for community health.	**Major** • Sea level rise of 19-33 cm will cause frequent and widespread coastal inundation. Saline intrusion of groundwater reservoirs will reduce water security. • Severe flooding and coastal erosion may overwhelm water tanks, wastewater infrastructure (especially septic tanks), treatment plants, drains and pumps. • Flooding-induced power outages and direct inundation may impact the operation of desalination plants, with severe consequences for community health.	**Medium** Although high confidence in future exposure and high-level consequences, confidence is reduced because there is limited information regarding water infrastructure systems, location, processes, and vulnerability

Water Resources| Complex Risks

Water security risks can interact with and compound other risks with significant consequences for community health in Nauru.

- **Infrastructure:** Extreme heat events will increase demand for desalinated water, whilst potentially increasing the risk of power outages that disrupt desalination plants.
- **Human health and wellbeing:** Droughts reduce water quality while also causing a decline in community hygiene and sanitation practices, leading to high disease and infection rates.
- **Agriculture:** Extreme heat events and droughts can significantly impact kitchen gardens and agriculture because water is prioritised for the community during these events, whilst heat-stress can harm livestock and crops.

Sector/domain 2: Health and wellbeing

Health and wellbeing | Overview

Climate-related impacts on public health include direct impacts (for example, heat stress and injuries from extreme weather events), indirect impacts on water security and safety (for example, water-borne diseases), food security and safety (for example, malnutrition and food-borne diseases), vector-borne diseases, respiratory illness, eye, ear and skin disorders and diffuse impacts through mental/psycho-social disorders. The Republic of Nauru Hospital provides free health care and dental treatment to Nauru citizens. Speciality treatment for diabetes and obesity-related illness is available at the Naoero Public Health Centre, however serious illnesses and injuries need to be evacuated to Australia for treatment.

Summary of health and wellbeing in Nauru

There are two major subsectors in the health and wellbeing sector:

1. Public health
- While Nauru has low rates of diarrheal disease, potentially due to the reliance on desalinated water, water-borne diseases and enteric infections are still prevalent, particularly after heavy rainfall, due to a lack of maintenance of rainwater tanks, poor drainage, and overflow of septic systems.
- Reliance on highly processed food imports has reduced the quality of food available. For example, a lack of fresh and healthy foods, with associated impacts on health such as high incidences of obesity, diabetes, and non-communicable diseases (**NCDs**)
- No fully formed mental health policy or act exists in Nauru at the time of writing, although a draft mental health policy has been developed.
- Low international travel and tourism numbers have reduced Nauru's exposure to communicable and vector-borne diseases.
- Heat-related illnesses directly impact local communities, causing increased morbidity particularly in the absence of a cool refuge.
- All pharmaceuticals are imported from Australia or the Netherlands and are vulnerable to supply disruptions

2. Nauruan workforce
    - Workforce skills, operation and productivity is vulnerable to hazards, particularly among outdoor workers and those without a cool refuge

Health and wellbeing | Overview

Concise risk statement:
Chronic and acute climate hazards will increasingly impact public health issues and the health, safety, and productivity of the Nauruan workforce, placing strain on the highly limited health services and impacting the economy of Nauru.

Hazards affecting this sector:
- Increased annual rainfall and extreme rainfall
- Rising temperatures and extreme heat
- Drought
- Sea level rise, extreme sea level events and coastal inundation
- Wind

Impacts on this sector:
- Increased demand for health services, particularly during extreme events, placing pressure on an already strained health system
- Increased incidences of water-borne disease and enteric infections
- Increased risk of mental health-related morbidity
- Increased risk of heat-related illnesses and morbidity
- Increased future risk of vector-borne disease
- Increased risk to the physical health, safety, and wellbeing of the community
- Increased risk of respiratory illnesses, such as asthma, from exposure to wind and dust, particularly when a hot dry period is followed by rain. Fires in the waste dump facility can also cause toxic air pollution
- Reduction in the health and productivity of outdoor workers and indoor workers where cooling is inadequate
- Reduced participation in outdoor exercise and associated health impacts from reduced opportunity to exercise, such as NCD incidences
- Increase in food insecurity – malnutrition, increase in obesity and NCDs
- Increase in water insecurity
- Increased impacts to medical supply chains, and medications and medical equipment that are electricity-dependant (for example, insulin requiring refrigeration).

Vulnerability factors relevant to this sector in Nauru:
- Large households and households with inadequate cooling
- Coastal communities are more exposed to sea level rise impacts
- Lower socio-economic demographic often more at risk of to water and food insecurity and extreme heat
- Variable household ownership of refrigerators and freezers
- High number of vulnerable groups, including children, older persons, those with pre-existing chronic health conditions
- Large percentage of households unable to afford healthy food, poor nutrition and high rate of NCDs, including nearly one in three of the population with Type 2 diabetes
- Low capacity of health sector workforce and dependence on expatriate contractors and expertise
- Isolation from specialised medical services only available overseas
- Frequent E. coli outbreaks due to degraded and variable quality of both groundwater extraction and septic systems
- Phosphate deposits in Nauru contain high levels of heavy metals which can leach into the soil and water
- No early warning system for communicable diseases
- Proposed improvements for water reticulation and sanitation are unfunded

Consequence to Nauru:
- Increasing strain on very limited health services
- Loss in workforce productivity and reduced outdoor physical activities
- Increases in health problems resulting in lower wellbeing
- Impacts to the Nauru economy

Health and wellbeing | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• It is difficult for the hospital to manage triage if more than five people are admitted at once. • Lower socioeconomic demographics and vulnerable groups such as the elderly, children, and people with pre-existing health conditions, are often more exposed to disaster events and water/food security. • 49% of households have been unable to eat healthy or nutritious food due to a lack of financial or other resources. 90% of Nauru's food is imported, with highly processed foods prevalent due to lower cost and longer preservation periods. • High rate of NCDs. For example, nearly one in three Nauruans have Type 2 diabetes • Inadequate housing can lead to physical safety risks during disasters. • Poor groundwater quality and no monitoring of groundwater resources increases risk of waterborne illnesses during disasters when there is insufficient access to freshwater resources. • Ongoing waste management and biosecurity issues increases risk of disease during disasters. • Low capacity of health sector workforce and dependence on expatriate contractors and expertise. • Isolation from specialized medical services only available overseas. • Phosphate deposits in Nauru contain elevated levels of heavy metals such as cadmium, lead, and arsenic which can leach into the soil and water. • Nauru does not have arrivals surveillance for disease upon entry into the country.
Average temperature and extreme temperature	• Large households, often with inadequate cooling, are vulnerable to extreme heat events. • 21.8% of households do not have air-conditioning

Health and wellbeing | Key vulnerability issues (cont.)

Hazard	Factor relevant for vulnerability
Sea level rise and coastal inundation	• Coastal location of many communities increases exposure to sea level rise and coastal inundation impacts
Extreme rainfall and average rainfall	• Degraded and variable quality of both groundwater extraction and septic systems increases exposure to *E. coli* outbreaks and other diseases, particularly during flooding and inundation events. • Roadside drainage is via soak pits, and it can take about half a day for water to subside, or longer if it's a period of heavy rain. • Nauru's main hospital experiences regular flooding due to poor maintenance of the drainage system.

Health and wellbeing | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Public health	**Heatwaves and extreme temperatures** Heat-related illnesses will continue to affect more people, whilst conditions will be more favourable for food-borne, infectious and vector-borne diseases, placing pressure on public health services, threatening community health and driving economic costs.	**Moderate** • Extreme heat is causing increased morbidity and affecting non-communicable diseases (NCDs) such as diabetes where indoor temperatures are above 26°C. • Hot days and heat waves are also associated with heat-stress related mental health impacts.	**Moderate** • Higher temperatures and heatwaves can lead to increased hospital admissions and affect NCDs. • Food handling in households may become a significant food safety issue due to increasing air temperatures and limited cold storage. • Increased pressure and costs for health service delivery.	**Major** • 44-169 more hot days (>32°C) will increase heat-related illnesses. • NCDs will also increase with reliance on imported foods. • Risks of vector-borne and diarrheal diseases will increase in hotter mean climate. • Significant effects on community health, the public health system, economy and livelihoods.	**Extreme** • 69-242 more hot days (>32°C) will significantly increase incidence of heat-related illness and morbidity from heat stroke. • Existing health conditions and NCD will be exacerbated, placing both chronic and acute pressure on public health services with widespread effects on physical and mental health, and economic productivity.	**Medium** Despite high confidence in overall health consequences, confidence is reduced because there is limited information available on water-borne disease and the effects of poor water quality on the population, and limited Nauru-based information on projections of public health pressures and the quantitative impact of extreme heat.

Health and wellbeing | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Public Health	**Extreme rainfall** Increasing water contamination and health impacts associated with poor water quality will affect vulnerable communities and result in significant costs.	**Moderate** • Flood-related water-borne disease and sanitation issues, including rotavirus, are arising due to limitations and exposure of wastewater and sewage treatment plants. • Exposure to inundation impacts mental wellbeing and disrupts health services with increasing costs.	**Major** • Worsening flooding and inundation will increase exposure to water-borne diseases and contamination • Hospital infrastructure will also be damaged with significant consequences for vulnerable communities and rising costs and pressure on the health system.	**Extreme** • Increasing extreme rainfall (+48 mm/day annual maximum daily rainfall) will be compounded by sea level rise (15-28cm) to significantly increase the risk of water contamination and vector-borne diseases. • Widespread mental and physical health impacts will place pressure on exposed health infrastructure and affect community wellbeing and productivity.	**Extreme** • Increasing extreme rainfall (+54 mm/day annual maximum daily rainfall) will be compounded by sea level rise (19-33cm) to cause widespread flooding and inundation that increases the risk of disease and health impacts associated with poor water quality (e.g., diarrhea). • Vector-borne diseases may also increase in wetter conditions. • Vulnerable communities, particularly in exposed coastal locations, will face extreme threats to physical and mental wellbeing, with significant pressure and costs for health services delivery.	**Medium** Despite high confidence in overall health consequences, confidence is reduced because there is limited information available on water-borne disease and the effects of poor water quality on the population, and limited Nauru-based information on projections of public health pressures and the quantitative impact of extreme heat.

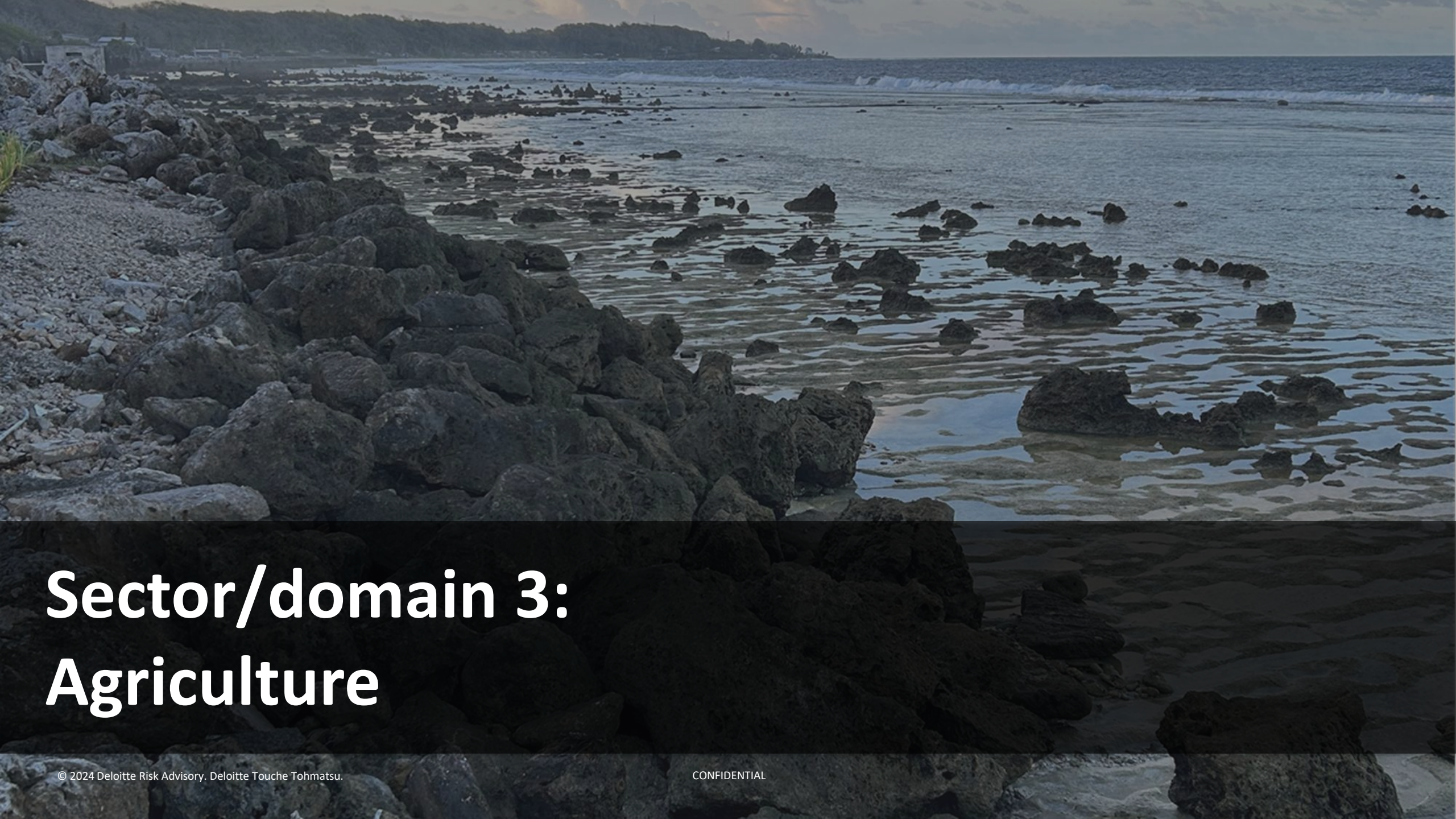
Health and wellbeing | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Nauruan workforce	**Extreme heat events** Heatwaves and hot days can cause heat-related illness and reduce workforce productivity with major effects on the economy, business continuity, water security, food security, infrastructure development, and both physical and mental health.	**Moderate** • Extreme heat events are increasing incidence of heat-related illness, such as heat stroke and heat stress, in the Nauruan workforce particularly in outdoor workers, including at the airport. • Workforce productivity is reduced by heatwaves and hot days with adverse effects on economic development and livelihoods.	**Moderate** • More severe heatwaves and hot days will continue to reduce productivity and threaten the wellbeing of the Nauruan workforce. • Significant flow-on effects for the economy and provision of essential services, such as education and healthcare, and resources, such as food and water.	**Major** • An increase in annual hot days (>32°C) of 44-169 days will have major effects on worker health and productivity as it becomes too hot to work outdoors at certain times of day and year. • Physical and mental health of vulnerable communities will be adversely affected by the reduction in livelihoods, food security, economic development and infrastructure development.	**Major** • An increase in annual hot days (>32°C) of 69-242 days will have major effects on worker health and productivity. • For the Oceania region, heat associated with a 2°C global warming is projected to cause a 12.9% reduction in labour productivity for agriculture, a 4.24% reduction for manufacturing, and a 0.12% reduction for services. • There will be widespread impacts on workers' physical and mental health, with potential loss or disruptions to the economy, essential services, business continuity, water security, food security, and infrastructure development.	**Medium** Although strong confidence in future exposure and high-level impacts, confidence is reduced due to the limited Nauru-specific information available on the impacts of extreme heat on worker health and wellbeing.

Health and Wellbeing| Complex Risks

Human health and wellbeing risks can interact with and compound other risks with significant consequences for community health and livelihoods in Nauru.

- **Infrastructure:** Disruptions and breakdowns in the infrastructure sector such as disrupted power supply and damage to the hospital, roads, airstrip, or port, will have flow-on consequences for health service provision, health infrastructure and public health.
- **Agriculture/Fisheries:** Problems arising in the agriculture and fisheries sector will have flow-on consequences for the health of the population through food security causing malnutrition and non-communicable disease.
- **Water resources:** Reduced water security will have large consequences to the health of the population through disease outbreaks, and the level of sanitation of water used in health facilities.



Sector/domain 3: Agriculture

Agriculture | Overview

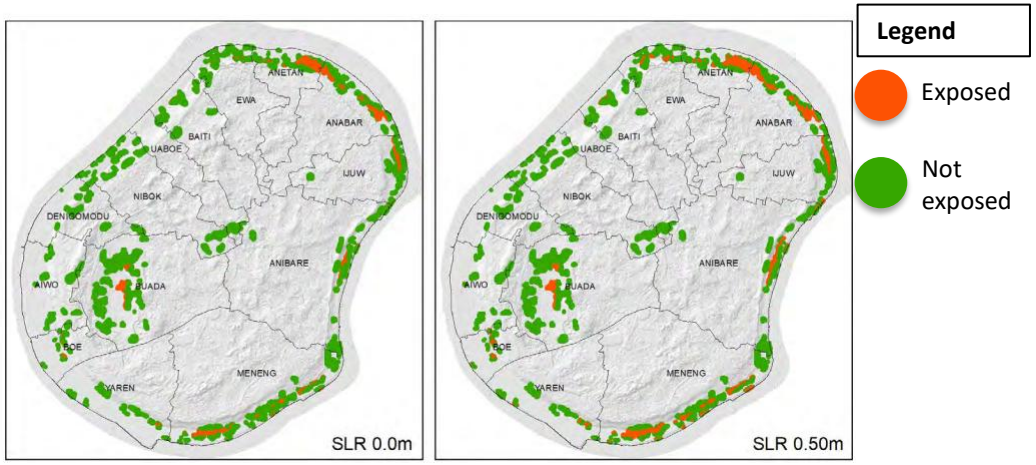
Agriculture in Nauru is mainly for domestic consumption, grown in kitchen gardens with some households producing root crops, in addition to bananas and coconuts , mostly on a subsistence basis. Formal agriculture in Nauru mainly revolves around breadfruit. Pigs and chickens are also farmed for domestic consumption

Summary of agriculture in Nauru

There are two major components of Nauru's agriculture sector:

1. Crops
    - Breadfruit, bananas, and coconuts, some root crops
    - Home Gardens
2. Livestock
    - Pigs and chickens

The below map illustrates the coconut crop features (a proxy for productive land) exposed to king-tide inundation for 0.0 m and 0.5 m SLR (expected around 2070) under a high emission scenario. Colours show whether land elevation beneath coconut crop feature is below static water level elevation (see legend).



Note that because this is an elevation-based study, Buada Lagoon exposure is overrated

Concise risk statement:

Chronic and acute climate hazards will increasingly impact the suitability of crop and livestock agriculture on the island, which is important for food security and the culture of Nauru.

Hazards affecting this sector:

- Drought
- Rising temperatures and extreme heat
- Sea level rise, extreme sea level events and coastal inundation
- Extreme rainfall

Impacts on this sector:

- More water required to upkeep agriculture practices due to extreme heat
- Saltwater contamination impacts freshwater lens
- Reduced land available for farming
- Outdoor worker productivity and health impacted by extreme heat
- Potential for increased invasive species, pests and diseases
- Increased **annual rainfall** will increase water supply if delivery and storage infrastructure is maintained and improved. However, water demand is likely to increase with a larger population living under more **extreme temperature** conditions. Therefore, while **drought** may occur less frequently, water availability will still be limited during these times, affecting community health, industry and agricultural production.
- Flood damage and reduced access to farms
- Waterlogging and inundation of crops
- Coastal inundation of home gardens

Vulnerability factors relevant to this sector in Nauru:

- Proximity of limited arable land to the coast
- Low soil carbon and limited soil moisture retention capacity
- Thin layer of topsoil increases vulnerability to soil loss through runoff and erosion
- Historical phosphate mining and dependence on imported foods diverted labour and investment in agriculture
- Limited access to fresh water

Consequence to Nauru:

- Increasing competition for water
- Public health impacted by decreased food security and poor diets (relying on imported, processed food)
- Loss of culture and income

Agriculture | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Yellow crazy ants have been found in Nauru which eat crops • Historical phosphate mining and dependence on imported foods has diverted labour and investment away from agriculture • No bees for pollination, instead relying on wasps, flies, moths, butterflies and hand pollination • Reliance on international aid and imports inhibits community-based adaptation efforts, such as community gardens, by reducing incentive to grow food • Population density and limited farmland in the Bottomside region reduces potential for any large-scale livestock or cropping activities • Less than 10% of households maintain some sort of vegetable garden and no major livestock farming • Higher population and increasing demand for food and increasing competition for water resources
Average temperature and extreme temperature	• Water is prioritised for human consumption during extreme heat and drought events, reducing water availability for livestock and crops • Pigs and chickens (integral to self-sufficiency) are prone to heat stress
Drought	• Limited water storage capacity reduces water availability and water quality for livestock and kitchen gardens during drought
Sea level rise and coastal inundation	• Land degradation due to phosphate mining has isolated remaining arable land to coastal regions vulnerable to inundation
Extreme rainfall and average rainfall	• Lack of vegetation can result in soil erosion during heavy rainfall

Agriculture | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Crops	**Drought** Increased annual-average rainfall will increase fresh-water access if delivery and storage infrastructure is maintained and improved. However, demand for water resources is likely to increase with higher evaporation due to more extreme temperature conditions. Therefore, while drought may occur less frequently, water availability will still be limited when drought occurs, affecting crop production.	**Moderate** • Drought is causing scarce water resources to be prioritised for domestic use, reducing the potable water available for agricultural uses.	**Moderate** • Water availability for crops is likely to remain similar in the near-term.	**Moderate** • Higher temperatures will increase evaporation, leading to greater water demand. Although droughts may be less frequent, water shortages during dry periods will still impact crop production.	**High** • Under a high emission scenario drought frequency is projected to remain unchanged. When combined this with higher water demand due to population growth and increased evaporation, water availability for crops can be further stressed.	**Medium** Moderate confidence due to some uncertainty in the net impact of future drought and increases in temperature, sea level and population on water availability

Agriculture | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Crops (cont.)	**Sea level rise** Saline intrusion and extreme sea level events erode arable land and reduce soil quality, affecting crop productivity and threatening food security and cultural practices.	**Moderate** • Sea level rise is inundating and salinising arable coastal land, potentially reducing the productivity of breadfruit and coconut crops (8% exposed to king tide inundation) which can have some implications on food security and cultural practices including traditional medicine. • Rising sea levels are also salinising Buada Lagoon, affecting food resources such as bananas, pineapples, vegetables, pandanus and indigenous hardwoods.	**Moderate** • Sea level rise of 10-18cm will see 8-10% of productive land (using coconut crops as a proxy) exposed to king-tide inundation as well as increasing salinity in Buada Lagoon and groundwater. • Lower crop productivity will reduce agricultural productivity, affecting food and economic security, health, and cultural practices.	**Moderate** • Sea level rise of 15-28cm will see 8-14% of productive land (using coconut crops as a proxy) exposed to king-tide inundation as well as increasing salinity in Buada Lagoon and groundwater. • Increased reliance on imported foods can have significant direct impacts on public health and wellbeing. • Cultural practices involving coconut and pandanus crops will also be affected.	**Major** • Sea level rise of 19-33 cm will see 10-14% of productive land (using coconut crops as a proxy) exposed to king-tide inundation as well as increasing salinity in Buada Lagoon and groundwater. • Increased reliance on expensive and processed imported foods will have significant direct impacts on public health and wellbeing • Cultural practices involving coconut and pandanus crops will also be affected.	**Medium** Limited information regarding location of crop plantations and the resilience to salinity reduces the high confidence in inundation projections.

Agriculture | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Livestock	**Drought** Water availability is a key limiting factor for raising livestock, especially pig production, thus drought is limiting agricultural productivity and potentially affecting the public health, food security and economy of Nauru.	**Moderate** • Drought is causing scarce water resources to be prioritised for domestic use, reducing the potable water available for agricultural uses.	**Moderate** • Water scarcity will cause increasingly saline groundwater to be used for livestock rearing activities such as watering pigs. • Communities will be impacted by lost livelihoods and reduced public health and productivity.	**Major** • Nauru will be more vulnerable to future periods of water scarcity due to a hotter climate with more significant saline intrusion and higher population, thus placing significant pressure on limited freshwater resources, reducing livestock productivity. • Adverse effects on communities' physical and mental wellbeing, as well as economic and food security.	**Major** • Increased annual-average rainfall will increase fresh-water supply if delivery and storage infrastructure is maintained and improved. However, livestock demand for water resources is likely to increase under more extreme temperature conditions. Therefore, while drought may occur less frequently, water availability will still be limited when drought occurs, affecting livestock production. • Adverse effects on livestock may lead to economic challenges for communities leading to physical and reduction in mental wellbeing, as well as economic and food security.	**Medium** Moderate confidence due to some uncertainty in the net impact of future drought and increases in temperature, sea level and population on water availability.

Agriculture| Complex Risks

Agricultural risks can interact with and compound other risks with significant consequences for community health and livelihoods in Nauru. For example:

- **Water security:** Extreme heat and drought, coupled with potential water scarcity, will have major impacts affecting both agriculture and domestic use of potable water. Water is prioritised for people first, reducing water access for livestock and kitchen gardens.
- **Social cohesion:** Rising sea levels will pose problems for agriculture in terms of competing land for agriculture activities.
- **Human health and wellbeing:** Despite relying on imports, Nauru's food security remains vulnerable to drought and climate change. Rising temperatures and erratic rainfall reduce local crop yields and strain household gardens. Increased droughts limit freshwater for irrigation, while climate-related disruptions to global supply chains can drive up food costs and reduce availability., placing a higher burden on public health.
- **Infrastructure**: Increased risk of power outages will affect the agricultural sector through inability to access water supply from desalination units.

Sector/domain 4: Fisheries and marine resources

Fisheries and marine resources | Overview

The primary objective of the fisheries sector in Nauru is to protect food security and maximise significant revenue for Nauru. The revenue earned from oceanic fisheries underpins significant government investment in health, education, and related services.

Summary of fisheries and marine resources in Nauru

There are three major subsectors in the Nauru fisheries sector:

1. Oceanic fisheries
   - Important for revenue security.
2. Coastal fisheries
   - Important for food security.
3. Aquaculture
   - Important for food security.

Concise risk statement:

Chronic and acute climate hazards will increasingly impact the viability of oceanic and coastal fisheries and aquaculture, which are important for both economic and food security, and hold cultural significance in Nauru.

Hazards affecting this sector:

- Extreme temperature
- Drought
- Sea surface temperature, marine heatwaves and ocean acidification
- Sea level rise, extreme sea level events and coastal inundation
- Extreme rainfall

Impacts on this sector:

- Damage to critical marine habitat reducing fish stocks
- Decreased sustainability of coastal fisheries
- Changing capacity for aquaculture
- Eastward shift relative to current position of oceanic fish stocks
- Potential fish spoilage
- Reduced resilience of reefs and coastal fisheries to runoff pollution, marine heatwaves, ocean acidification

Vulnerability factors relevant to this sector in Nauru:

- Some reliance on coastal resources for food security
- High reliance on fishing licences for national revenue
- Limited drainage facilities increases exposure to phosphate mining and run-off that affects coral reefs
- Overfishing has depleted coastal fish stocks, reducing fisheries resilience to climate hazards
- Lack of implementation and enforcement of traditional or legislative restrictions on coastal fishing (pg. 46 VA)

Consequence to Nauru:

- Significant loss of key revenue sources and livelihoods
- Increased food insecurity and flow-on effects for public health
- Loss of cultural practices

Fisheries and marine resources | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Overfishing and limited protected areas have depleted fish stocks, reducing fisheries resilience to climate hazards • Higher population relates to increasing demand for fish and aquaculture • Lack of implementation and enforcement of traditional or legislative restrictions on coastal fishing (pg. 46 VA)
Average temperature and extreme temperature	• Limited cooling infrastructure available for local fishers
Drought	• Drought increases the vulnerability of Nauru's fisheries by reducing freshwater availability, which can affect aquatic habitats, particularly inshore ecosystems like lagoons and coral reefs. Lower freshwater input can lead to higher salinity, disrupting fish populations and local biodiversity. This, in turn, threatens food security and livelihoods reliant on fishing.
Sea surface temperature	• Reliance on oceanic fishing licences for the country's revenue increases vulnerability to changes in sea surface temperature that displace fish stocks
Marine heatwaves, sea level rise and ocean acidification	• Reliance on coastal fisheries for community's food supply can result in overfishing and increases vulnerability to marine heatwaves, sea level rise and ocean acidification that threaten coastal fisheries
Heavy swells	• Local use of small fishing boats that are not safe during high wind/wave days
Extreme rainfall and average rainfall	• Limited drainage facilities increases exposure to phosphate mining run-off may affect coral reefs

Fisheries and marine resources | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Oceanic fisheries	**Sea surface temperature** • Present day impacts of sea surface temperature is minimal but can change in future • Changes in SST may displace good fishing grounds, threatening the availability of tuna species that support the Nauru economy through access fees with consequences for the provision of essential services and community wellbeing.	**Minor** • Tuna access fees currently total US$29.6million, providing roughly 31% of government revenue. • Higher purse-seine catches are made in Nauru during El Nino whilst quotas decrease during La Nina as the fish move away. • Minor disruptions and impacts to government revenue and employment.	**Moderate** • No specific projection of Tuna fish displacement is available for 2030. However, studies (Bell et al 2021) have shown potential tuna displacement in 2050. See 2050 timeframe for more information.	**Moderate** • Although the average purse-seine catch of tuna is projected to increase by 5.7% by 2050 under RCP4.5, with a 1.7% increase in revenue, significant uncertainty in SST projections reduce confidence in these projections. • Good fishing grounds could be displaced further eastward along the equator or shift to higher latitudes, with significant affects on government revenue.	**Major** • Under RCP8.5, by 2050 the average purse-seine catch is projected to decline by 21.6%, with a 6.5% decrease in revenue. • The loss of critical government revenue will have widespread flow on effects for the wellbeing of the community, affecting the provision of essential services, critical infrastructure and development projects.	**Medium** Despite high confidence in impacts, confidence is reduced because there is considerable uncertainty in the timing and magnitude of tuna redistributions in Nauru due to the influence of ENSO on east-west displacements of skipjack tuna and the lower confidence in SST projections for the Pacific.

Fisheries and marine resources | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Coastal fisheries	**Marine heatwaves and sea surface temperature** Coral bleaching and rising SSTs is compounding with the impacts of overfishing resulting in reduced resilience of coastal fish stocks and reef ecosystems	**Moderate** • Coastal fisheries are important for food security with 72.3% of Naruan households fishing for home consumption. • In 2005, Nauru experienced a 'mysterious' fish kill speculated to be caused by algal bloom and/or heat shock triggered by prolonged elevated water temperature, or an upwelling of de-oxygenated water from depth.	**Major** • Severe coral bleaching may occur on an annual basis by 2035 under RCP8.5, with significant impact to coral reefs and dependant coastal fisheries. • Reduced catch from fishing will significantly impact food security and commercial fishing, threatening community health, wellbeing and livelihoods.	**Major** • Rising SSTs, 105-140 marine heatwave days per year and 92-236 coral bleaching days per year will cause widespread and significant coral mortality. • Coastal fish habitats will be extensively damaged causing significant reductions in coastal fish stocks. • Food security and commercial fishing will be severely impacted with widespread effects on community wellbeing and livelihoods in Nauru.	**Extreme** • By 2050, increasing SSTs will cause coral reef fish biomass to decrease by 20% under a high emissions scenario. • 180-270 marine heatwave days and 107-344 coral bleaching days per year will cause severe, widespread and potentially irreversible damage to fragile reef ecosystems. • The potential impact on coastal fisheries will impacts food security and commercial fishing.	**Medium** Although there is high confidence in future impacts and consequences, confidence is reduced by the lack of specific coastal fisheries projections and lack of spatial uniformity in future coral bleaching reduces confidence.

Fisheries and marine resources | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Aquaculture	**Drought** Rainfall is a key limiting factor for aquaculture in Nauru because Buada Lagoon is rainfall dependent and sensitive to drought affecting the ability to farm milkfish, a culturally important source of food and revenue for local communities.	**Moderate** • Water scarcity is already affecting aquaculture, with up to half of Buada Lagoon drying up during the long periods of drought, significantly reducing the milkfish farming capacity. • This has affected communities' food, livelihoods and cultural practices.	**Moderate** • Milkfish farming can be impacted in drought periods. Although drought is likely to become less frequent in 2030 compared to baseline other factors such as saline intrusion, higher temperature can potentially impact aquaculture. This threatens the livelihoods, culture, and food security of local communities.	**Major** • Nauru will be more vulnerable to water insecurity occurring in a hotter climate with increasing demand for aquaculture, having a significant effect on aquaculture in Buada Lagoon. • Rising water temperatures can compound the impacts of reduced water during drought, causing chronic stress in juvenile milkfish. • Communities will lose an important source of revenue and food, as well as cultural practices.	**Major** • Aquaculture will be significantly impacted by periods of water scarcity occurring in a hotter climate with higher demand as the milkfish farming capacity of Buada Lagoon is reduced. • Rising water temperatures can compound the impacts of reduced water, causing chronic stress in juvenile milkfish. • Communities will lose an important source of revenue and food, as well as cultural practices.	**Medium** Moderate confidence due to some uncertainty in the net impact of projected changes in drought, demand and water temperature.

Fisheries| Complex Risks

Fisheries climate-related risks can interact with and compound other risks with significant consequences for community health and livelihoods in Nauru. For example:

- **Cross-cutting:** Loss of income from reduced catch and lower fish availability in ocean fisheries will have significant consequences for the Nauruan economy, with flow on effects across the nation.
- **Human health and wellbeing:** Reduced productivity of coastal fisheries and aquaculture catch will have flow on consequences for the health sector, creating nutrient deficiencies and other health impacts.
- **Community and culture:** Disruption to coastal fishing and aquaculture will have flow on consequences for cultural practices, resulting in a loss of shared identity, values, and beliefs.

Sector/domain 5: Disaster management

Disaster management | Overview

The disaster management sector of Nauru aims to reduce the impact of disasters such as droughts, floods and inundation by providing community education and early warnings, carrying out disaster response activities and implementing disaster recovery initiatives.

Summary of disaster management in Nauru

The major subsector in the Nauru disaster management sector is emergency services, which includes:

- Early warning systems
- Disaster response activities including four fire trucks
- Disaster recovery initiatives and resources including international aid
- Disaster management workforce (Division of National Disaster Management (DNDM), Meteorology and Hydrology Service, Ambulance, Lifeguard, National Disaster Risk Management Office)

Concise risk statement:

Chronic and acute climate hazards will increasingly impact disaster risk management and emergency services, which are important for reducing the impacts of disasters and protecting human health, essential services and infrastructure in Nauru.

Hazards affecting this sector:

- Extreme temperature
- Extreme rainfall
- Sea level rise, extreme sea level events and coastal inundation
- Drought
- Fires

Impacts on this sector:

- Coastal erosion exposing unexploded World War II ordnances
- Increased risk of black-outs and cascading impacts for cooling, lighting, refrigeration, business, telecommunication and transport which affects disaster response initiatives and coordination
- Damage and disruption to property and infrastructure
- High demand for emergency response and recovery services
- Reliance on international aid
- Strong winds also increase phosphate pollution which can cause a variety of health issues, including mineral and bone disorders associated with chronic kidney disease and cardiovascular system issues

Vulnerability factors relevant to this sector in Nauru:

- Lack of quality data to inform disaster risk reduction planning
- Reverse Osmosis (RO) water is used for fire-fighting due to saline groundwater affecting the pipes and pumps of the fire truck
- Limited RO water delivery capabilities
- Limited road network makes firefighting and other disaster response efforts vulnerable to disruptions
- DNDM unit is a couple of years old and still establishing communication processes and emergency alerts
- Early warning systems are not integrated, reducing effectiveness and efficiency of communication.
- Reliance on international aid

Consequence to Nauru:

- Risks to public health and safety both during and after disasters
- Interruptions to essential services such as health, education and transport
- Loss of economic and agricultural productivity

Disaster management | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Complete dependency on electricity from diesel generator for desalination increases vulnerability to power outages during disasters. • Increasing population is increasing demand for water resources and energy. • People are highly reliant on RO water • Lack of quality data to inform disaster risk reduction planning • RO water used for firefighting due to saline groundwater affecting the pipes and pumps of the fire truck. • No monitoring of underground water resources to assess extraction or salinity. Groundwater in central part of Topside is particularly low quality, considered brackish at the surface and seawater at 20m • DNDM unit is a couple of years old and still establishing communication processes and emergency alerts
Drought	• Limited water storage capability reduces water availability and quality especially during drought, with 64% households main water supply prone to drying up. Nearly three-quarters of all households reported that their water supply dries up, with 8.4 percent of households reporting that this occurs frequently. • Coastal plants, such as coconut and pandanus, are not resilient to extended periods of drought. • There currently are too few delivery trucks to distribute water adequately in times of drought, with 48.6% of Nauruans depending on RO water supply from tanker trucks for drinking water. • 22.7% of households report being able to use relatives' or neighbours' water resources during drought, reducing vulnerability. • Roughly two-thirds of households having guttering, of which one-third was reported as needing repair or replacement, reducing ability to harvest water.
Average temperature and extreme temperature	• Extreme temperatures and drought increase the risk of fires • 21.8% of households do not have air-conditioning
Extreme rainfall and average rainfall	• Degraded and variable quality of both groundwater extraction and septic systems increases exposure to E. coli outbreaks and other diseases. • Land-based pollution, mining run-off and sediment movement increases the vulnerability of water catchments and drains to flooding events.
Sea level rise and coastal inundation	• Proximity of 93% population and infrastructure to the coast increases vulnerability to sea level rise and coastal inundation

Emergency services | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Emergency services	**Coastal inundation from king tides and storm surge** • Worsening inundation and high community vulnerability to natural disasters threatens emergency response infrastructure and places significant pressure on emergency services to protect human health, property, infrastructure and livelihoods.	**Moderate** • Coastal inundation events damage infrastructure and drive community demand for coastal protection infrastructure, early warning systems and access to emergency resources such as RO water. • Post-disaster recovery assistance is required to repair damage. • Unexploded ordnances from WWII are increasingly exposed by coastal erosion.	**Moderate** • Continued sea level rise (7-14cm) will drive coastal inundation events, threatening infrastructure, property, agriculture, human health and water security, and exposing unexploded ordnances. • Major demand and pressure on emergency services to prepare and manage impacts of coastal inundation events. • Disruptions to critical infrastructure supporting emergency services will affect the ability to carry out emergency response activities, threatening public health and safety.	**Moderate** • Sea level rise (15-28cm) and storm events is likely to cause some damage and destruction to coastal regions, including exposing unexploded ordnances, increasing demand for emergency services, especially early warning systems and response activities. • Disruptions and damage to critical infrastructure such as roads, ports, hospitals, power, and ICT systems will impact emergency response infrastructure and reduce the ability of emergency services to respond to events, threatening the safety of vulnerable communities.	**Major** • Continued sea level rise (19-33cm) and storm events will increase the severity of coastal inundation, causing damage, erosion, and exposing unexploded ordnances. • Demand for emergency services, especially early warning systems, will also increase as the risk to infrastructure and human health becomes extreme. • Disruptions and damage to critical infrastructure such as roads, ports, hospitals, power, and ICT systems will impact emergency response infrastructure and reduce the ability of emergency services to respond to events, threatening the health and wellbeing of the population.	**Medium** Despite high confidence in exposure, confidence is reduced because it is unclear to what extent development of DNDM unit will improve resilience and preparedness, and ensure emergency services can operate in future scenarios.

Disaster management| Complex Risks

Risks to disaster risk management can interact with and compound other risks with significant consequences for community health and livelihoods in Nauru.

- **Infrastructure:** Extreme heat events increase demand for emergency water and air-conditioned refuges while also causing power and ICT outages and disruptions to infrastructure and communication that inhibits desalination operations, the provision of emergency resources and communication of emergency messages.

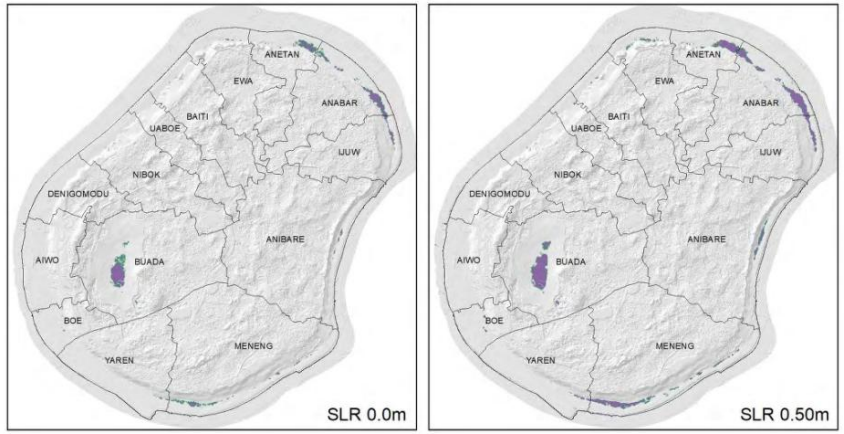
Sector/domain 6: Coastal protection and infrastructure

Coastal protection and infrastructure | Overview

Nauru is an island which has a total land area of 21 square kilometres. 93% of the population live within 1km of the coast, and infrastructure within 100 m of the coast accounts for 34% of the total asset number and 40% of the total infrastructure replacement value.

Summary of Coastal protection and infrastructure in Nauru
There are six major subsectors in the Nauru Coastal protection and infrastructure sector:

- Coastal assets
- Internet and telecommunications
- Transport and supply
- Energy security
- Building and structures, and
- Waste management.



Nauru land area exposed to coastal inundation for different increments of sea level rise which can occur around 2070 under a high emission scenario. Note that because this is an elevation-based study, Buada Lagoon exposure is overrated.
Source: NIWA (2020)

Concise risk statement:
Chronic and acute climate hazards will increasingly impact built infrastructure and hinder Coastal protection, which are crucial for the livelihood and safety of Nauruan communities and economic development of Nauru.

Hazards affecting this sector:

- Extreme rainfall
- Wind and storm conditions
- Extreme temperature
- Drought
- Sea level rise, extreme sea level events, changing wave direction and coastal inundation
- Sea surface temperature, marine heatwaves and ocean acidification

Impacts on this sector:

- Damage to critical infrastructure and buildings from salt spray build-up, ocean acidification, rust, coastal inundation and erosion, flooding, overheating, and windborne debris
- Reef loss
- Power outages
- Road and runway integrity affected by melting tar and potholes
- Disruption to port operations
- Sediment and debris in drainage systems
- Fallen trees disrupt road transport
- Disruption and damage to port infrastructure and services due to extreme waves
- Loss of connectivity and transmission of critical internet services such as weather updates
- Fires in the waste disposal area

Vulnerability factors relevant to this sector in Nauru:

- Limited capability for repairing/maintaining equipment and infrastructure
- Poor condition of housing, construction materials, overcrowding, and limited household commodities leading to increased exposure to extreme temperature
- Proximity of communities and infrastructure to the coast increases vulnerability to extreme sea level events
- Ineffective drainage system and underdeveloped guttering
- Frequent, unplanned power outages
- Land tenure requires negotiation for infrastructure development including relocation away from coastal areas
- Inconsistency in sea walls and potential changes in wave direction

Consequence to Nauru

- Described in the following page

Coastal protection and infrastructure | Sub-systems

Consequences to Nauru when different infrastructure are impacted by climate hazards

Coastal assets (Coastal defense structure, fisheries infrastructure)
- Damage to coastal defense infrastructure increases community and infrastructure exposure to inundation and requires increased spending to prevent further consequences to other sectors
- Damage of fisheries equipment decreases productivity

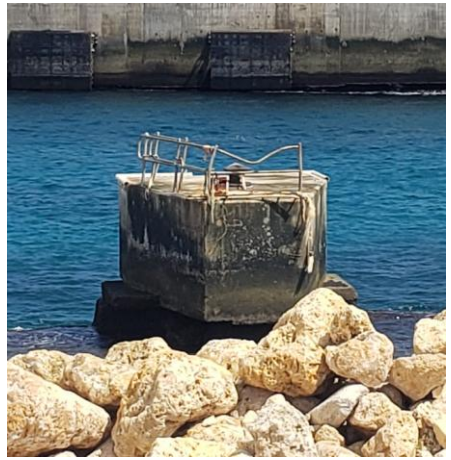
Internet and telecommunications (Telecommunications tower, internet infrastructure)
- Disruption of internet and telecommunications affects the livelihood of Nauruans who access weather forecasts, tide information, and market prices through the internet, access telemedicine consultation for medical advice or and text blasts for emergency notifications

Transport and supply (Roads, airport and ports)
- Economic cost of the disruption and damage of roads, ports and airports assets, and services
- Impacts to Nauruan livelihoods as most food and medicine are imported
- Health impacts from interrupted access to/for emergency services

Energy security (Electricity wires, generators)
- Loss of power can affect critical infrastructure such as transport, telecommunications, and wastewater, with disruption to services such as early warning systems for natural disasters, lighting and cooling, education, commerce, shops, reverse osmosis, and hospitals
- Health and safety consequences as blackouts disrupt critical health services and air conditioning during hot days and heatwaves
- Disruption of reverse osmosis water supply. This water is used for consumption and firefighting

Building and structures (Residential, commercial, Government, industrial, education buildings, health infrastructure)
- Health, safety and productivity consequences as blackouts disrupt critical services and air conditioning during hot days and heatwaves
- Flooding damage to buildings, including hospitals, houses and schools, disrupts critical services and incurs major recovery costs
- Implementation of digital clinical processes results in high reliance on internet connectivity

Waste management (Rubbish tips, wastewater management facilities, septic tanks)
- Contamination of water catchments, lagoon and freshwater lens
- Contamination of coastal fisheries which supplement food security
- Fires in the waste dump impact air quality
- Sewage overflow into populated areas



Coastal protection and infrastructure | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Frequent, unplanned power outages can impact essential services including ICT, disaster response, surgery, and hospital equipment • ICT generator installation in Feb 2024 reduces vulnerability • Reliance on imported diesel and PV systems for power generation increases vulnerability to supply disruptions during and after disaster-events • Nauru airport runway hasn't been re-surfaced for more than 30 years despite recommendations to re-surface every 15 years • 20% of households are reported not having access to the internet and ICT outages occurring during severe weather • Housing shortage across Nauru creating overcrowding issues • No building code in Nauru • Limited capability for repairing/maintaining equipment and infrastructure • Ongoing waste management and biosecurity issues increases risk of disease during disasters • Land tenure requires negotiation for infrastructure development including relocation away from coastal areas • Increasing population is increasing demand and competition for services and resources
Average temperature and extreme temperature	• Land clearing for urbanisation is reducing space available for large trees and reducing natural shade coverage • Limited cooling infrastructure increases community vulnerability to extreme heat events. 21.8% of households do not have air-conditioning
Drought	• Proximity of transmission lines to the ocean increases vulnerability to dry periods when salt build up on crossarms can cause outages
Sea surface temperature, marine heatwaves and ocean acidification	• A large portion of Nauru's infrastructure currently is located within 100m of the coast which accounts for 34% of the total asset number and 40% of the total infrastructure replacement value. As sea level rises, inundation and erosion can increase vulnerability of these infrastructure especially given a large part of Nauru's coastline is still without seawalls.

Coastal protection and infrastructure | Key vulnerability issues (cont.)

Hazard	Factor relevant for vulnerability
Sea level rise and coastal inundation (cont.)	• Access to limestone boulders reduces vulnerability by increasing Nauru's ability to domestically produce coastal defence infrastructure • Sea walls are constructed with varying quality and different materials. • A 5-year ARI inundation event directly impacts 46% of Nauru's population and 154 of 2471 buildings would be exposed under a 1.0m SLR scenario (which is projected to occur after 2100), with the bulk of these being residential buildings • Only 15.4% households are connected to piped sewage with degraded groundwater extraction and septic systems increasing the risk of E. coli outbreaks and other diseases Assume you mean limestone boulders?
Heavy swells	• Local use of small fishing boats that are not safe during high wind/wave days
Extreme rainfall and average rainfall	• Drains are often poorly maintained and were designed to soak water into the ground to prevent wash into the reef, delaying drainage times during extreme rainfall events and requiring pit maintenance • Hospital regularly floods due to poor drain maintenance • Roughly one third of households have no guttering with 15% of households in need of guttering repair • The dump site is unlined, so heavy rainfall can cause increased pollution

Coastal assets | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Coastal defence structures	**Rising sea levels** Wave energy can damage and destroy sea walls, creating debris and exposing communities and infrastructure to inundation and coastal erosion.	**Moderate** • Erosion and rock displacement from rising sea levels is placing increasing pressure on sea walls, reducing the size and effectiveness of sea walls in some regions with flow on effects for coastal communities and infrastructure.	**Moderate** • Sea level rise of 7-14 cm will cause worsening erosion and rock displacement, especially in aging walls with insufficient rock armour. • Communities and coastal infrastructure will be threatened by potential rock displacement, hazardous debris and inundation.	**Major** • Sea level rise of 15-28 cm and changing wave direction threatens to overtop and damage existing sea walls. • In addition to increased exposure of communities and infrastructure to potential rock displacement, hazardous debris, inundation and flooding, significant costs will be required to replace and improve coastal defence structures.	**Major** • Sea level rise of 19-33 cm and changing wave direction will cause overtopping and damage to existing sea walls. • Community safety and coastal infrastructure will be threatened by potential rock displacement, hazardous debris, and inundation, with significant government intervention required to replace and improve coastal defence structures.	**Medium** Detailed inundation assessment of individual walls will provide the evidence required to increase confidence.

Coastal assets | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and high emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Fisheries infrastructure	**Storm conditions** Large swells can damage fishing infrastructure and equipment through salt spray, wave damage, reducing workforce productivity and safety, and increasing maintenance costs with impacts to the livelihoods, safety and food security of communities.	**Minor** • Salt spray is increasingly a problem for the maintenance of fisheries equipment, particularly during dry periods when rainfall does not wash the salt away. • Storm conditions can reduce safe fishing conditions and damage equipment, reducing productivity and threatening human safety.	**Minor** • Salt spray, airborne debris and waves will continue to damage fishing infrastructure and equipment and threaten the safety of coastal fishers. • Community safety, food security and livelihoods will continue to be affected.	**Moderate** • Storm conditions will continue to reduce safe fishing conditions for local fishers. • Rising sea levels will result in larger wind-induced swells that affect fishing infrastructure and equipment. • Projected increase in annual rainfall may reduce damage from salt spray. • Reduced workforce productivity will affect livelihoods and food security, and human safety will be threatened.	**Moderate** • Projected decrease in drought and increase in annual rainfall may reduce damage from salt spray. • Livelihoods and food security of communities will be affected by reduced productivity.	**Low** Despite high confidence in the potential impacts, there is very limited future remote storm-induced swell projections, which significantly reduces confidence.

Internet and telecommunications (ICT) | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Internet and telecomm-unications	**Extreme rainfall and storms** ICT connectivity in Nauru is disrupted by flooding, clouds and winds during storms which interrupt satellite connections, cause black outs and damage ICT infrastructure, with widespread effects on the provision of essential services, such as education, health care and disaster risk management (including early warning systems), economic development and community wellbeing.	**Moderate** • Clouds, heavy rain and winds during storms cause the loss of satellite data and internet connectivity. • Flooding of electricity infrastructure can cause power outages that disrupt ICT connections. • Salt spray damages transmission towers and the fibre cable network and support strand, causing loss of connectivity. • The lack of reliable ICT connection interrupts the development of Nauru and threatens community safety during disasters.	**Moderate** • Heavy rain and winds during storms will continue to disrupt satellite ICT connections and damage fibre cable networks. • The provision of education, health care and disaster risk management services may be affected by the loss of ICT connection during extreme weather events. • Resilience of ICT infrastructure to rain and storms will be improved by the submarine East Micronesia Cable (EMC), as well as the replacement of wooden crossarms with fibreglass that reduces the impact of salt build up on transmission lines.	**Moderate** • Possibility of significant increases in annual total rainfall (-1 to 52%) and a 48 mm/day increase in annual maximum daily rainfall, will cause more frequent and widespread disruptions to existing ICT infrastructure. • The development of the Nauru economy, essential services and human health will be threatened, especially when the loss of internet and telecommunication services inhibits warnings and communication during extreme weather events. • The installation of the EMC will reduce the effect of rain and storms on ICT connectivity, although extreme wave events compounded by rising sea levels may cause water to overlap the artificial wall at the EMC landing site.	**Moderate** • Possibility of significant increases in annual total rainfall and a 54 mm/day increase in annual maximum daily rainfall will cause severe and frequent disruptions to ICT infrastructure. • Disruptions to disaster response efforts, health care and early warning systems due to a loss of ICT will have major consequences for community safety and wellbeing during disaster events. • Commercial activities, economic development and education will be affected by ICT disruptions. • The installation of the EMC will reduce reliance on satellite data and existing fibre cables for internet connectivity, increasing ICT resilience to worsening rainfall and storm events. • The EMC may be threatened by storm surges and storm cell driven wave action compounded by rising sea levels which can overtop the artificial wall at the EMC landing site.	**Medium** Despite high confidence in future exposure and high-level consequences, confidence is reduced by the limited detailed information regarding the impacts of hazards on critical ICT infrastructure and how the successful introduction of EMC will reduce current ICT vulnerability.

Transport and supply | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Transport and supply	**Coastal inundation from king tides and storm surge** Sea level rise, combined with extreme weather conditions like storm surges and high waves, can severely impact port development, inundating roads, and threatening the airport runway, disrupting critical transport networks and supply chains with widespread affects on community health and economic productivity. .	**Moderate** • Extreme sea level events are threatening the airport which is on the low-lying coastal plain, with the lowest point of the paved runway only 0.3m above current king tide levels. • Critical road networks are also affected by king tides with 2.7km of roads exposed to 1-in-5-year inundation event and 382m of roads below the current king tide level. • There was a storm that disrupted the port development in 2024. In future, once the port is built, under a 0.5m rise of sea level (expected after 2070 under a high emission scenario), higher swell coming into the berthing area may compromise its safe use. • As a result, coastal inundation is impacting the key transport and supply networks supporting the Nauru economy and providing essential food and medical resources.	**Moderate** • By 2040, 624m of roads will be below the king tide level. • More severe storm surges may cause overtopping events that inundate the southern section of runway runway (expected beyond 2100 under a high emission scenario). • Port infrastructure will face worsening impacts from inundation and wave impacts. • The movement of people and resources such as food, building materials and medical supplies will be restricted during inundation events, with widespread adverse effects on the health and livelihoods of vulnerable communities.	**Major** • By 2060, 625-900m of roads will be below king tide elevation. • The airport and runway can face increasing risk of inundation and flooding during extreme sea level events which are expected beyond 2100 under a high emission scenario. • The port will be placed under significant pressure during extreme wave and storm surge events. • Major disruptions to all building materials, manufactured foods, and critical emergency relief will threaten the safety and productivity of Nauruans.	**Major** • By 2060, 900m of roads will be below king tide elevation. • The airport is resilient up to a 1.5m SLR with less than 1% area impacted under such scenario. It is likely to have minimal impact in 2050.will be at risk of inundation across the runway. • Port infrastructure will be exposed to more frequent overtopping during storm surge and king tide events. • Human health and wellbeing is likely to be impacted essential services and medical supplies are disrupted due to extreme water events.	**Medium** The high confidence in future impacts and consequences is reduced by the limited detailed information regarding the future exposure of the port development and overall risk reduction achieved by Higher Ground Initiative.

Energy security | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Energy security	**Extreme heat events** Heatwaves and hot days can disrupt power supply by causing transformers to overheat, inhibiting critical maintenance and increasing electricity demand for air conditioners, refrigeration and fans, with cascading impacts across a wide range of sectors and communities, including disrupting critical services (including health services, RO water supply, ICT connection and disaster response activities) and businesses.	**Moderate** • High temperatures can cause transformers to overheat up and lose capacity/operate at reduced efficiency, especially on the eastern side of network. • High electricity demand on hot days is causing blackouts with implications for community health, essential services and productivity.	**Moderate** • More severe heatwaves and hot days will place pressure on energy infrastructure and lead to increasing energy demand for fans, air-conditioning and refrigeration. • Power outages will disrupt hospital and desalination operations, disaster response activities and internet and communications connectivity with implications for community health, productivity and wellbeing.	**Major** • An increase in annual hot days (>32°C) of 44-169 will significantly increase energy demand for cooling purposes, whilst also disrupting critical maintenance and causing transformers to overheat. • Without sufficient upgrades and controls, power outages will become more frequent and widespread during hot periods, affecting the provision of essential services, such as health, RO water, disaster response, ICT, commercial and education services, with major consequences for community safety, wellbeing and productivity.	**Major** • An increase in annual hot days (>32 °C) of 69-242 days will significantly increase energy demand for thermal control, whilst also disrupting critical maintenance and overheating energy infrastructure, such as transformers. • Intervention will be required to prevent more frequent and widespread power outages during hot periods, which threaten the provision of essential services, such as health, RO water, disaster response, ICT, commercial and education services, with major consequences for the safety, wellbeing and productivity of vulnerable communities.	**Medium** High confidence in future impacts and consequences is reduced by uncertainty over how the introduction of solar power will improve resilience of power supply during hot days and heatwaves.

Buildings and structures | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Buildings and structures	**Coastal inundation from king tides and storm surge** A large portion of Nauru's infrastructure is located close to the coast with 40% of total infrastructure replacement value located within 100m of the coast. As a result under present-day conditions, some degree of inundation and flooding can damage private, government, commercial, education, health, and industrial buildings.	**Moderate** • 6.2% of Nauru's buildings are currently exposed to a 1-in-5-year coastal inundation event and 13 buildings are below the king tide elevation level. • Annual economic losses caused by coastal inundation are USD 1.3 million (model estimate based on expected replacement costs), with impacts on human health, livelihoods and essential services.	**Moderate** • By 2040, 31 buildings will be below the king tide level. • Nauru's 'Bottomside' residents will be particularly affected, with some of the residential property, critical health buildings and transport structures in that area at risk of inundation.	**Moderate** • By 2050, projections for sea level rise (SLR) are 0.21 (0.15 to 0.28) m for low emissions and 0.25 (0.19 to 0.33) m for high emissions, with minimal additional impacts to infrastructure. Currently 0.7 % of buildings are exposed to coastal inundation, and by 2070 this may increase to 2.3 % i.e. a 0.35 m sea level rise. • Service provision will be disrupted. • Major costs for maintenance, repair and replacement of exposed buildings.	**Major** • By 2060, 49 buildings will be below the king tide level. • By 2100, 16.7% of buildings are projected to be inundated by a 1-in-5-year coastal inundation event by 2100. • Health, safety and housing of community members will be compromised across the region. • Productivity and livelihoods will be disrupted by damage to commercial and industrial buildings.	**Medium** Despite strong evidence for 2060 and 2100 consequences, there are no 1-in-5-year building inundation projections available for 2030 or 2050. Additionally, high confidence is reduced because development and infrastructure protection projects may reduce future exposure to inundation.

Health infrastructure | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Health infrastructure	**Extreme rainfall** Health care facilities are in low-lying areas, making them vulnerable to direct damage and disruptions to critical infrastructure, accessibility and supply chains during floods, with major consequences for community health, disaster response activities and the provision of health services.	**Moderate** • Republic of Nauru (RoN) Hospital is regularly flooded due to poor drainage maintenance. • Storms disrupt the supply of pharmaceuticals and affect critical infrastructure such as power supply and ICT connectivity.	**Moderate** • Extreme rainfall will cause more frequent and widespread flooding of health facilities. • Accessibility for patients and staff may be inhibited and critical infrastructure may be disrupted. • Significant consequences for public health and the provision of health services.	**Moderate** • More intense extreme rainfall events (+48 mm/day annual maximum daily rainfall) will cause more severe inundation of health facilities. • Critical infrastructure (power and ICT), hospital accessibility and supply of medical goods may be disrupted with widespread impacts for community health, disaster response activities and health service provision.	**Major** • Increasingly severe extreme rainfall events (+54 mm/day annual maximum daily rainfall) will cause more severe flooding of health facilities. • Loss of critical infrastructure (power and ICT), hospital accessibility and pharmaceutical will have severe impacts on public health, disaster response activities and the provision of health services.	**Medium** Although high confidence in future consequences, confidence is reduced without specific hospital or health facility flood-risk projections.

Waste management | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Waste management	**Extreme rainfall** Flooding can cause the dumpsite to overflow and leak into soil, coastal areas and water catchments, as well as impacting drainage systems and causing septic tanks to overflow with significant impacts on water quality and community health.	**Moderate** • Extreme rainfall events cause pollution and waste from septic systems, drains and the unlined dumpsite to enter terrestrial and marine habitats, and ground and surface waters. • Adverse effects on biodiversity, fisheries and water quality have implications for community health, livelihoods and food security.	**Moderate** • Extreme rainfall will cause worsening run-off, overflow and leakage from waste management systems, causing solid waste and sewage to pollute water catchments and ecosystems. • Declining water quality and ecosystem health will increase the risk of disease and impact the productivity of fisheries, affecting community health and wellbeing.	**Moderate** • More intense extreme rainfall events (+48 mm/day annual maximum daily rainfall) will compound increasing waste from population growth and reliance on imported goods to cause worsening pollution of surface and ground water, soil and marine habitats. • Longer-term and widespread impacts to ecosystems and water quality will affect community health and livelihoods.	**Major** • Compounding increasing waste from population growth and reliance on imported goods, increasingly severe extreme rainfall events (+54 mm/day annual maximum daily rainfall) will cause worsening pollution of water catchments, terrestrial and marine ecosystems. • Longer-term and widespread impacts to ecosystems and water quality will threaten community health and productivity.	**High** Strong evidence only marginally reduced by lack of annual maximum daily rainfall (mm/day) projection for 2030.

Coastal protection and infrastructure | Complex Risks

Infrastructure risks can interact with and compound other risks with significant consequences for community health and livelihoods in Nauru.

- **Agriculture/Fisheries:** Extreme heat events can disrupt storage, cooling and transport infrastructure whilst also reducing agricultural and fisheries productivity, threatening food security in Nauru.
- **Biodiversity:** Flooding that causes waste to overflow or leach into soil, terrestrial habitats and marine ecosystems affects water quality, public health, and fisheries productivity, as well as causing significant biodiversity loss.
- **Water resources/Health and wellbeing:** Electricity and ICT disruption has cascading and compounding impacts on transport supply chains, telecommunications, waste management, health care and water supply, with serious implications for service delivery and human safety.
- **Coastal protection and infrastructure:** Infrastructure disruptions will affect workplaces and residential buildings with flow on consequences for social cohesion as people experience workforce and home duties disruption, as well as migration to less exposed regions or higher ground.

Sector/domain 7: Biodiversity and environment

Biodiversity and environment| Overview

Biodiversity in Nauru has significant cultural, economic and environmental value, and provides critical ecosystem services such as coastal protection, food resources and traditional medicines.

Summary of biodiversity in Nauru

There are two major components to Nauru's biodiversity:

1. Aquatic and coastal biodiversity:
    - Nauru's marine biodiversity consists of coral ecosystems and migratory fish such as tuna.
    - There are very small numbers of mangroves near the lagoon and no sea grass in the coastal areas of Nauru.
    - Green turtles are reported to nest in Nauru with legislation introduced to protect them.

2. Terrestrial biodiversity:
    - Nauru has 36 native bird species, including noddy birds which are hunted for domestic consumption and frigate birds that have cultural value.
    - Nauru has experienced significant loss of diversity, with no endemic plants and 63 Indigenous plant species remaining. The remaining Indigenous plants, such as the pandanus, are well adapted to climatic conditions and have cultural value.

Chronic and acute climate hazards will increasingly impact the aquatic, coastal and terrestrial biodiversity of Nauru, which are important for associated sectors such as fisheries, agriculture, freshwater, coastal protection and the culture of Nauru.

Hazards affecting this domain:

- Rising temperatures and extreme heat
- Extreme rainfall
- Drought
- Sea surface temperature, marine heatwaves and ocean acidification
- Sea level rise, extreme sea level events and coastal inundation

Impacts on this domain:

- Habitat damage and loss of key cultural plants and foods
- Decreased coastal and pelagic marine resources and coastal fish
- Warmer sand temperature can affect gender ratios for turtle hatchlings
- Increased pollution and sediment entering Buada Lagoon, streams and coastal waters
- Water stress and dieback of plants and animals, even affecting Indigenous plants adapted to dry conditions such as pandanus
- Reduced coral integrity, decreased coastal invertebrate species, increased algae growth

Vulnerability factors relevant to this domain in Nauru:

- Phosphate mining affects coral communities
- Low potential for coral recruitment due to distance from other islands
- Overfishing and overhunting compounds problems related to critical habitat loss
- No formally protected areas and limited communication to ensure sustainable hunting
- No planning regulations
- Remnant flora and fauna are in a highly disturbed state, despite high cultural and ecological value

Consequence to Nauru:

- Loss of biodiversity will affect Nauruan culture, food security, water security and the economy
- Loss of ecosystem services for coastal protection, provision of shade, protection from wind and desiccating effects of salt spray

Biodiversity and environment | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Lack of communication and education means hunters are not aware of appropriate hunting times and procedures, causing overexploitation (including the harvest of more than 300,000 black noddys per year) and biodiversity loss • Most of Nauru's limestone forest and woodland has been removed or intermingled with 161 invasive species. The limestone forest tree Aidia racemose, known locally as enga, is also close to extinction. • Low potential for coral recruitment due to distance from other islands and reefs • Overfishing has depleted fish stocks in the region and unbalanced the overall fish community structure with a lack of predators, reducing fisheries resilience to climate hazards • Noddy birds are overhunted and forced to nest along the coast because escarpment trees inland have been cleared for development and phosphate mining • No formal terrestrial or marine conservation sites • No bees for pollination, instead relying on wasps, flies, moths, butterflies, and hand pollination • Growing population is increasing competition for land, water and resources • Interconnectivity of transient marine and avian species with wider climatic changes and impacts abroad • No planning regulations • Remnant flora and fauna are in a highly disturbed state, despite high cultural and ecological value
Drought	• Buada Lagoon is rainfall dependent and highly modified due to proximal human settlements and milkfish aquaculture • Uncertainty around the pollution of groundwater by both human sources and saline ingress
Extreme rainfall and average rainfall	• Limited drainage facilities increases exposure to phosphate mining and run-off that affects coral reefs

Biodiversity | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Aquatic and coastal biodiversity	**Marine heatwaves and sea surface temperature** Coral bleaching and rising SSTs will compound the impacts of overfishing to damage, deplete and reduce the resilience of aquatic and reef ecosystems with major consequences for the aquatic and coastal biodiversity of Nauru.	**Moderate** • Average of 16 marine heatwave days per year are causing coral bleaching and impacting the spawning and survival of coastal species. • The 2005 fish kill is speculated to have been caused by algal bloom and/or heat shock triggered by prolonged elevated water temperature, or an upwelling of de-oxygenated water from depth. • Rising sea surface temperatures can also reduce the spawning and recruitment of deepwater species.	**Major** • Warming seas will affect the suitable foraging and spawning habitat available for oceanic species. • Severe pressure will be placed on coastal and aquatic species already threatened by overfishing and pollution with potential for major loss of biodiversity.	**Major** • In Nauru, 12-18 severe bleaching events/ 20 years (low vs. high warming model) compared to 2 events in 2005. • Rising SSTs, 105-140 marine heatwave days per year and 92-236 coral bleaching days per year will cause widespread and significant coral mortality. • Fish habitats will be extensively damaged, compounded by overfishing and increased pollution, causing significant reductions in fish stocks. • Aquatic and coastal biodiversity will be severely threatened with potential for major loss of biodiversity.	**Extreme** • In Nauru, 11-22 severe bleaching events/ 20 years (low vs. high warming model) compared to 2 events in 2005. • In Nauru, severe coral bleaching may occur on an annual basis by 2048 under RCP8.5, with significant impact to coral reef ecosystems and aquatic biodiversity. • By 2050, increasing SSTs will cause coral reef fish biomass to decrease by 20% under a high emissions scenario. • Compounded by overfishing and increasing pollution, 180-270 marine heatwave days and 107-344 coral bleaching days per year will cause severe, widespread, and potentially irreversible damage to fragile reef ecosystems. • The potential collapse of coral reef ecosystems and altered oceanic habitat may cause mass biodiversity loss.	**Medium** Although there is high confidence in future impacts and consequences, no specific projections for loss of coral reefs and aquatic habitats, and lack of spatial uniformity in future coral bleaching, reduces confidence.

Biodiversity and environment | Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Terrestrial biodiversity	**Drought** While **drought** may occur less frequently, plant water use is likely to increase under **more extreme temperature** conditions and higher evaporative demand. Therefore, when drought does occur, terrestrial biodiversity will be more adversely affected resulting in the loss of important ecosystem services.	**Moderate** • Drought is already affecting terrestrial biodiversity, with indigenous island-adapted species such as pandanus, breadfruit trees and coconut trees dying and producing produce of a reduced size during the most recent drought. • Intervention has been required to import and replace lost plants.	**Moderate** • Water scarcity will continue to threaten terrestrial biodiversity by placing further pressure on Indigenous species, particularly plant species. • This will affect the culture and food security of local communities.	**Major** • Nauru's biodiversity will be more vulnerable to water scarcity occurring in a hotter climate with more significant saline intrusion and a higher human population as water resources are reduced and groundwater becomes more saline, resulting in significant effects on terrestrial biodiversity, particularly plant species. • Communities will be affected by the loss of important ecosystem services, such as food, erosion control, shade and medicine.	**Major** • Terrestrial biodiversity, especially plants, will be more vulnerable and impacted by periods of water scarcity which occur in a hotter climate with rising sea levels and a higher human population as water resources are reduced and groundwater becomes more saline. • Communities will suffer from the loss of ecosystem services, such as food, erosion control, shade and medicine.	**Medium** Moderate confidence due to some uncertainty in the net impact of projected changes in drought, anthropogenic pressures and increases in sea level.

Biodiversity and Environment| Complex Risks

Biodiversity and environment climate change-related risks can interact with and compound other risks with significant consequences for community health and livelihoods in Nauru. For example:

- **Agriculture and fisheries:** Loss of biodiversity and damage to ecosystems will reduce the productivity of agriculture, aquaculture, and fisheries with consequences for food security, livelihoods, and public health in Nauru.
- **Infrastructure:** Loss of ecosystem services, including coastal protection from reefs, shade provision, erosion control and salt spray protection, will affect coastal communities and infrastructure with implications for human safety and the provision of essential services.

Sector/domain 8:
Land management and rehabilitation

Land management and rehabilitation | Overview

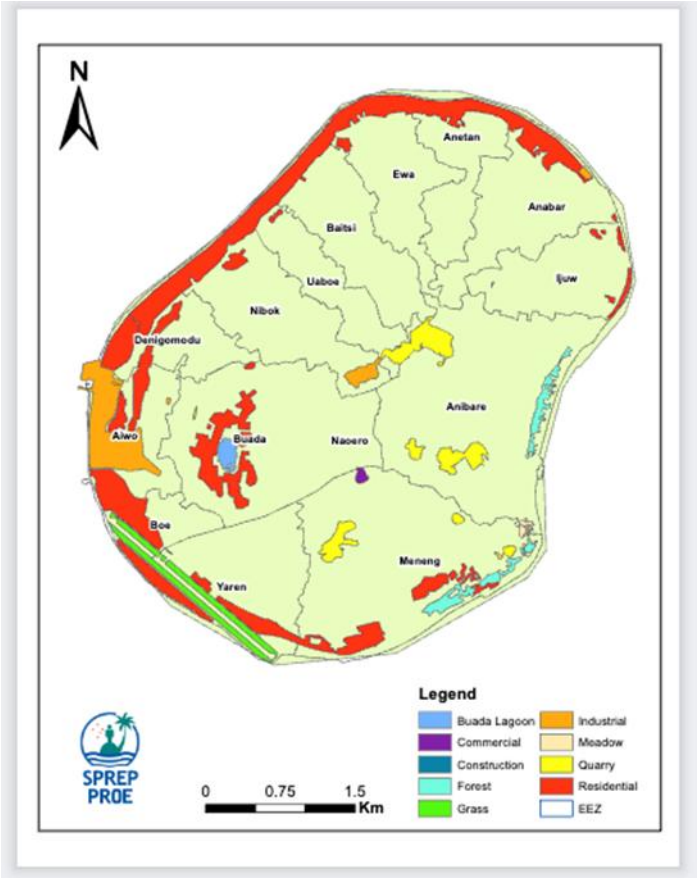
Nauru has been extensively degraded by past and current mining activities, with slow rehabilitation processes. Land rehabilitation is highly expensive due to the cost of flattening limestone pinnacles but crucial to supporting agriculture development, conservation, water catchment, residential development, and commerce and industry development. The Higher Ground Initiative (HGI) is an integrated land use plan aiming to increase the availability of land resources for agriculture and housing, improve waste management to reduce land degradation and contamination risks, and increase biodiversity, energy, and water resilience. The HGI and other land management initiatives are inhibited by both outdated environmental legislation and inadequate land use planning due to weak policies, fragmented land governance institutions, limited capacity, the strength of customary land tenure systems, the lack of a building code and a lack of spatial and cadastral data for evidence-based decision making.

Summary of land management and rehabilitation in Nauru

There are two major subsectors in the Nauru land management and rehabilitation sector:

1. Land use
    - Land is owned by 12 different clans/groups and land-use needs to be negotiated and appropriately compensated
    - There is limited comprehensive and up-to-date data on land use and ownership
    - Due to the strength of customary land tenure systems, there is no provision for compulsory acquisition of land by the state for public purposes (although the government can override the minority) which is required to meet new infrastructure around housing and energy
    - Over 90% of land is owned on a customary basis.
    - Limestone boulders are used in construction as armour rock for low lying islands, providing export and income generation opportunities
    - Unexploded ordnances are an ongoing challenge

2. Higher Ground Initiative
    - Rehabilitate Topside for agriculture, settlement, service provision and biodiversity
    - Base for new water, energy, and sewage systems
    - No mention of Protected Areas



Land use map of Nauru by SPREP

Land management and rehabilitation | Overview

Concise risk statement:
Chronic and acute climate hazards will increasingly impact the land management and rehabilitation strategies currently in place, which are important for the sustainability of Nauruan land, livelihoods and culture.

Hazards affecting this sector:
- Extreme temperature
- Extreme rainfall
- Drought
- Strong winds
- Sea level rise and coastal inundation

Impacts on this sector:
- Disruptions and delays to Higher Ground Initiative including reduced labour productivity
- Flood damage to land rehabilitation sites; changes in flood risk also have implications for land management (e.g., flood zones)
- Reduced access to water for construction and dieback of vegetation
- Increased demand for land management services to clear fallen trees and debris, and address exposure of unexploded ordnances
- Disruption and damage to land management infrastructure due to inundation and erosion
- Exposure of Further contamination of Buada Lagoon, land, ocean and groundwater lens from waste contamination

Vulnerability factors relevant to this sector in Nauru:
- Weak and limited integrated planning, including no building code, outdated laws, and complex tribe-based land ownership
- Significant cost to flatten pinnacles (on top of rehabilitation and topsoil addition costs)
- Reliance on international funding for rehabilitation
- Limited comprehensive and up-to-date cadastral and spatial land use data which impedes evidence-based decision-making
- No mention of Protected Areas in the HGI

Consequence to Nauru:
- Increased competition between sectors for viable land
- Inability to perform land management actions needed to reduce vulnerability
- Significant cost of rehabilitation and development
- Competition for diminishing available land may cause unrest, threatening community bonds and impact culture as people move from their traditional homes

Land management and rehabilitation | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Topside's degraded state remains a key limitation on adaptation pathways, such as retreat of housing, development of renewables and agriculture • Significant cost to flatten pinnacles (on top of rehabilitation and topsoil addition costs) • Limited land rehabilitation capacity • Weak and limited integrated planning, including no building code and fragmented institutional environment regarding land governance • Land use planning delays and complexity of tribe-based land rights and ownership system, current approaches to land ownership and leasing both present risks to development • Potential value of limestone for export and income generation can increase hesitancy to sell land • Laws related to lands and survey haven't been updated since the 1970s • Limited comprehensive and up-to-date data on land use and ownership and gaps in spatial and cadastral data which impede evidence-based decision-making • Reliance on international funding for rehabilitation • No mention of Protected Areas in the HGI • Growing population is increasing competition for land, water and resources

Land management| Consequence

Sub-systems being assessed	Most prominent hazard being assessed	Baseline risk (current)	Consequence score			Confidence score
	Hazard	Current	2030 Low and High emissions scenario	2050 Low emissions scenario	2050 High emissions scenario	
Land rehabilitation	**Drought** While **drought** may occur less frequently, plant water use is likely to increase under **more extreme temperature** conditions and higher evaporative demand. Therefore, when drought does occur, terrestrial biodiversity will be more adversely affected resulting in the loss of important ecosystem services.	**Moderate**	**Moderate**	**Major**	**Major**	**Medium** Moderate confidence due to some uncertainty in the net impact of projected changes in drought, anthropogenic pressures and increases in sea level.
	Projected increases to **average rainfall**, along with **fewer droughts**, may improve options for any terrestrial biodiversity improvements and agricultural pursuits. When **droughts** occur, they will be experienced along with more extreme temperature conditions					

Land Management| Complex Risks

Complex risks

- **Water resources:** Drought and extreme heat can reduce water availability and increase water demand, limiting the water available for construction and land rehabilitation activities.
- **Social cohesion:** Disruptions to the Higher Ground Initiative and diminishing available land may cause unrest and increase competition for limited land resources, as well as threatening community bonds and culture as people move from their traditional homes.

Sector/domain 9: Community and culture

Community and culture | Overview

To become more resilient to climate change, Nauru has strategies for building the capacity of individuals and the community through cultural preservation initiatives, support for women's and youth affairs, support for family and community services and promoting community participation.

Summary of community and culture in Nauru

There are three major subsectors in the Nauru community and culture sector:

1. Culture
   - Cultural practices
   - Cultural sites
2. Social cohesion
   - Human capacity
   - Social inclusion/capital/ networks
   - Gender equality
3. Community development
   - Food initiatives and co-ops
   - Education
   - Critical services support
   - Cultural initiatives
   - Empowerment of vulnerable populations

Concise risk statement:

Chronic and acute climate hazards will increasingly impact cultural practices and sites, social cohesion and community development, which are important for the resilience of Nauru's communities.

Hazards affecting this sector:

- Extreme heat
- Extreme rainfall
- Drought
- Sea level rise and coastal inundation

Impacts on this sector:

- Water, land and food insecurity can lead to community unrest
- Inundation-driven migration threatens community bonds and culture
- Lower human capacity due to more destructive or frequent severe weather events
- Poverty due to a shifts in funding and budget concerns due to damage from severe weather events
- Disruption of people at school and work due to impact of hazards, including power outages
- Disruption of essential services required for community development
- Success of kitchen gardens compromised by climate hazards
- Reduced labour productivity in communities
- Stress and die back of cultural plants (pandanus)
- Damage and destruction of cultural sites

Vulnerability factors relevant to this sector in Nauru:

- Historical exploitation, degradation of the Topside and previous occupations of island has resulted in disadvantage, reliance on aid, and loss of culture
- High rate of NCDs and poverty, low rate of secondary and tertiary education
- Tribe-based land rights and ownership requires deeper exploration of customary land management and adaptation practices

Consequence to Nauru:

- Weaker social capital, networks and increase in gendered inequality
- Continued loss of cultural practices and significant sites
- Disruptions to human development

Community and culture | Key vulnerability issues

Hazard	Factor relevant for vulnerability
All hazards	• Topside's degraded state inhibits human development and has caused the loss of cultural practices and traditions, such as hunting and agriculture, and increased reliance on imported goods • High rate of NCDs and poverty, low rate of secondary and tertiary education • Tribe-based land rights and ownership requires deeper exploration of customary land management and adaptation practices • Historical exploitation and previous occupations of island has resulted in disadvantage, reliance on aid, and loss of culture

Community and Culture| Complex Risks

- **Agriculture/Fisheries/Biodiversity:** Hazards which impact food production, commercial activities and biodiversity will have flow on impacts for community development and cultural practices.
- **Water resources:** Extreme rain and drought can affect water availability and infrastructure, which can drive unrest and affect social cohesion.
- **Coastal protection and infrastructure:** Infrastructure disruptions will affect workplaces and residential buildings with flow on consequences for social cohesion as people experience workforce and home duties disruption.
- As coastal protection is challenged and land erosion occurs, people will be forced to move further away from the coast, placing pressure on municipal services, and increasing density living. Additionally, cultural landmarks and places of significance may be damaged or destroyed. This has flow on consequences to social cohesion.
- **Human health and wellbeing:** If fractures within social cohesion occur, mental health issues will rise, placing the health sector under strain.

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