



Ankiwid ekekeōw:

Õredoānen ãañabidāen obwiõ

Climate change:

Building our resilience

Republic of Nauru
Framework for Climate Change
Adaptation and Disaster Risk
Reduction
(RONAdapt)



Government of the Republic of Nauru

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MINISTER'S FOREWORD

I am pleased to present the Republic of Nauru's Framework for Climate Change and Disaster Risk Reduction (RONAdapt). Implementation of this important document will guide us in building a productive, healthy and sustainable Nauru by tackling our vulnerabilities and increasing our resilience to the impacts of climate change and natural disasters. It will also assist us to address many of our sustainable development challenges relating to our geographical isolation, limited land mass, environmental degradation, lack of financial resources and capacity constraints.

Climate variability and natural disasters are already affecting Nauru. We have experienced serious droughts, with significant impacts on our health, food security and the economy. Drought periods also increase the risk of fires, which are potentially disastrous given Nauru's isolation and lack of access to alternative medical treatment, power, and water supplies. Longer term climate projections are for changed rainfall patterns, sea level rise, increased frequency of storm surges, higher air temperature, higher ocean temperature and increasing ocean acidification. These changes place greater stress on water resources, health and domestic food production, and pose risks to precious groundwater reserves and important infrastructure.

Nauru like all its Pacific neighbours is vulnerable to climate variabilities and natural hazards. Our preparedness for disaster risks remains important, particularly those relating to drought, tsunamis, coastal erosion and flooding. It is also imperative that we are prepared for those other disaster risks such as supply chain disruptions, fires, and damage to critical infrastructure such as the hospital, power station and fuel storage facilities.

This document is the result of a consultative process beginning in 2010 that engaged key stakeholders in government and in the community. It clarifies priority actions for government departments and ministries and supports the implementation of the National Sustainable Development Strategy 2005-2025. In doing so it makes an important contribution to the mainstreaming of climate change and disaster risk considerations across the public sector.

Resources and skills will be needed to implement the priority actions in RONAdapt and to identify, plan and implement future activities to continue building the resilience of Nauru to climate change and potential disasters. Successful implementation will be heavily dependent on resources being made available by external development partners to supplement limited domestic funds. Nauru intends to place considerable emphasis on working with its bilateral partners and regional agencies, for the financial and technical resources needed for implementation.

I call upon the efforts and support of the international community to progress the aspirations of this national document into reality.

Hon. Aaron Cook, MP
Minister for Commerce, Industry & Environment



ACKNOWLEDGEMENT

The RONAdapt document was developed over a period of five years, between 2010 and 2014, and involved extensive consultation and review by all government sectors, civil society and the general public in Nauru.

Several regional and international partners have played a significant role in the development of RONAdapt. These include:

- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)
- Secretariat of the Pacific Community (SPC)
- Secretariat of the Pacific Regional Environment Programme (SPREP)
- World Health Organisation (WHO)

The advice of the many reviewers of this document is also acknowledged.



SPC
Secretariat
of the Pacific
Community



LIST OF ACRONYMS

AOSIS	Alliance of Small Island Developing States
BSRP	Building Safety and Resilience in the Pacific project
CBO	Community based organisation
CEAFM	Community based ecosystem approach to fisheries management
CCA	Climate change adaptation
CIE	Department of Commerce, Industry and Environment
DFSD	Department of Finance and Sustainable Development
DoA	Department of Agriculture
DM	Disaster management
DRM	Disaster risk management, including DRR and DM
DRR	Disaster risk reduction
EEZ	Exclusive economic zone
EIA	Environmental Impact Assessment
ENSO	El Niño-Southern Oscillation
ER	Emergency Response
FAO	Food and Agriculture Organisation of the United Nations
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HFA	Hyogo Framework for Action: 2005-2015 'Building the Resilience of Nations and Communities to Disasters'
HLCCSC	High Level Climate Change Steering Committee
ICZMP	Integrated Coastal Zone Management Plan
MCS	Monitoring, control and surveillance
MLUP	Master Land Use Plan
MoE	Ministry of Education
MoH	Ministry of Health
NBSAP	National Biodiversity Strategic Action Plan
NCCHAP	National Climate Change and Health Action Plan 2012
NCDs	Non-communicable diseases
NDC	National Development Committee
NDRMO	National Disaster Risk Management Office
NEISIP	Nauru Economic Infrastructure Strategy and Investment Plan 2011
NFMRMA	Nauru Fisheries and Marine Resource Management Authority
NFOS	National Fisheries Objectives and Strategies 2003-2010
NRC	Nauru Rehabilitation Corporation
NSDS	Nauru Sustainable Development Strategy 2005-2025
NUC	Nauru Utilities Corporation
NWSHP	Nauru Water, Sanitation and Hygiene Policy 2012
NWSHIP	National Water, Sanitation and Hygiene Implementation Plan 2012
ODA	Official Development Assistance
PAD	Planning and Aid Division, Ministry of Finance
PEQD	Pacific Equatorial Divergence
PIFACC	Pacific Island Framework for Action on Climate Change
PSC	Project Steering Committee
ROC-TTM	Republic of China-Taiwan Technical Mission
RONAdapt	Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction
RONPHOS	Nauru Phosphate Corporation
RPC	Regional Processing Centre
SIDS	Small Islands Developing States
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Program
SPSDAg	Strategic Plan for the Sustainable Development of Agriculture in Nauru 2007-2017
TWG	Technical Working Group of CIE
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organisation



EXECUTIVE SUMMARY

This document – the Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt) – represents the Government of Nauru's response to the risks to sustainable development posed by climate change and disasters. It aims to do two things.

First, it identifies immediate priorities relating to climate change adaptation (CCA) and disaster risk reduction (DRR), in order to clearly articulate these for all government ministries, state owned enterprises, the private sector, civil society, communities and development partners to engage with. These priorities are described in Section 4.

Second, it provides a general framework for longer term planning and programming of CCA and DRR activities, including guidance on their mainstreaming in national and sectoral development policies. This includes setting out the key principles that are expected to guide CCA and DRR planning in Nauru (Section 2), as well as clarity on the roles and responsibilities of different stakeholders (Section 5).

As the National Sustainable Development Strategy (NSDS) highlights, Nauru already struggles with the challenges of ensuring sustainable social and economic development. A scarcity of arable land and fresh water resources, geographic isolation, dependence on imports for meeting basic food and energy needs, environmental degradation and the emergence of chronic health problems all make achieving sustainable development a difficult task, and at the same time also create vulnerability to other stresses, such as those brought on by climate change and disasters.

Against this background, climate variability and climate change have the potential to make Nauru's efforts to secure sustainable development even more challenging. Sea level rise threatens to increase saltwater intrusion into precious groundwater reserves as well as to exacerbate coastal erosion and flooding during storm events. Changes in rainfall patterns will likely affect water scarcity, while important fish resources may be affected by changes in ocean temperature and acidification.

RONAdapt is intended to support progress towards the country's national development priorities and the goal of environmental sustainability, by ensuring that a focus on reducing vulnerabilities and risks is incorporated into planning and activities across all sectors of the economy and society. The priority actions identified here are not intended to be an exhaustive list of CCA and DRR needs. As experience, knowledge and better understanding of the impacts of climate change grows, further priority actions will be identified. Successful adaptation is a process over time and RONAdapt will be reviewed every five years to incorporate new and emerging priorities.

The document is set out as follows:

- Section 2 outlines the principles upon which planning should be based, helping to guide the government as well as the community to ensure climate change and disaster risks are taken into account in planning;
- Section 3 explains the broader policy context, both at the international and national level, clarifying the role of the RONAdapt in supporting implementation of the National Sustainable Development Strategy and sector policies and plans;
- Section 4 defines key activities to be undertaken in the near-term by different ministries, consisting of specific interventions focused on CCA and/or DRR as well as actions to strengthen institutional capacities and support mainstreaming of vulnerability and risk-reduction across government and the community; and
- Section 5 summarises the responsibilities and institutional arrangements across government for reducing vulnerability and risks associated with climate change and disasters, and specifically for implementing the RONAdapt's priority activities.

While there is overwhelming scientific consensus that anthropogenic climate change is already taking place and there are already signs of disturbance to local, regional and global systems, there remains a significant degree of uncertainty about the precise nature and scale of impacts at the scale of a country like Nauru. Therefore, the focus of the near-term actions identified here is on so called "no-regret" options that support Nauru's development strategy while also providing a strong basis for improving and enhancing adaptive capacities and capabilities to respond to future risks and events as they unfold.

Resilience goals

The priorities outlined in the RONAdapt are intended to contribute to the achievement of the NSDS and to increasing Nauru's resilience to climate change and disasters, by targeting the following goals:

1. Water security
2. Energy security
3. Food security
4. A healthy environment
5. A healthy people
6. Productive and secure land resources

Priority actions

The table below provides an overview of the prioritised high-level strategies for addressing CCA and DRR in each sector. The proposed activities to implement these strategies are outlined in Section 4, while more detail on each sector is provided in the Annexes.

Overview of the RONAdapt's priority CCA and DRR actions

SECTOR	STRATEGY
Water	<ul style="list-style-type: none"> • Fill information gaps and increase access to baseline information about the water sector • Increase water supply and storage capacity • Reduce water demand through appropriate conservation measures • Rehabilitate and protect groundwater resources • Disaster and contingency management for water sector
Health	<ul style="list-style-type: none"> • Fill key knowledge and awareness gaps to reduce community health risks, including those relating to the impacts of climate change • Reduce chronic health problems of the community • Expand environmental monitoring capacity • Build human capacity of health services • Secure key health infrastructure and services against extreme events

Overview of the RONAdapt's priority CCA and DRR actions (continued)

SECTOR	STRATEGY
Agriculture	<ul style="list-style-type: none"> • Improve water security for agricultural needs • Increase household engagement with agriculture and livestock • Improve grower skills and practices
Fisheries and marine resources	<ul style="list-style-type: none"> • Fill knowledge gaps-identify and document vulnerable fisheries and marine resources • Support a community-based ecosystem approach to fisheries management (CEAFM) • Promote aquaculture as an important contributor to food security that can reduce pressure on coastal fisheries • Strengthen the human capacity of government and community stakeholders
Disaster management and emergency response	<ul style="list-style-type: none"> • Fill knowledge gaps and ensure equitable access to information • Improve community preparedness and response systems
Energy	<ul style="list-style-type: none"> • Reduce electricity demand for water • Expand renewable energy capacity • Reduce transport fuel use while ensuring mobility • Improve local capacity for managing and maintaining a sustainable energy sector • Reduce risk of major fire outbreak at tank farm
Land management and rehabilitation	<ul style="list-style-type: none"> • Increase availability and productivity of land resources • Improve waste management to reduce land degradation and contamination risks
Infrastructure and coastal protection	<ul style="list-style-type: none"> • Reduce coastal risks to key infrastructure • Reduce flooding occurrence and intensity
Biodiversity and environment	<ul style="list-style-type: none"> • Designate areas for conservation of biodiversity • Protection of flora and fauna, through control of invasive species
Community development	<ul style="list-style-type: none"> • Take greater account of gender in planning • Implement community development strategies of the Ministry of Home Affairs, relating to women and youth, family services, preservation of cultural resources, and livelihood development
Education and human development	<ul style="list-style-type: none"> • Skills transfer to local Nauruans during development projects

In addition, a series of institutional strengthening actions are highlighted for each sector. These include for example updating and formally endorsing a wide range of draft policies and plans, the preparation of a long-term Nauru Land Use Plan, and building the human capacity of the public sector in particular to be better placed to manage and implement essential development and CCA and DRR activities. These are important for putting in place some of the necessary enabling conditions that support sound long-term planning and decision making.



1. INTRODUCTION

1.1 Development challenges, vulnerability and climate change

Nauru's National Sustainable Development Strategy (NSDS) outlines our main social, economic and environmental challenges, and key development priorities. These developmental and environmental challenges also illustrate Nauru's vulnerability to external stresses and risks, including those posed by climate change and disasters.

Building a productive, happy, healthy and sustainable Nauru means tackling our vulnerabilities and increasing our resilience. Vulnerability is not simply the product of climate change or disaster events, it is created or reduced by many factors in combination. At the household and individual level, vulnerability of people is influenced by their access to a healthy environment, social networks, financial resources, knowledge, and so on. In turn, access to these capacities is influenced by for instance gender, disability, household income and household location, among others.

At the national and community scale in Nauru, some of the factors that create vulnerability in Nauru are:

- **Scarce water resources** – With small land area and very limited groundwater resources, water scarcity is a major concern. Rainwater harvesting is an important source, though is constrained by the poor condition of roofing catchments and other components (gutters and tanks). Climate variability is a contributor to drought periods that place great stress on the limited desalination and community storage capacity, and create water stress for many households. Moreover, limited groundwater resources are typically polluted from septic systems, and hence use is limited.
- **Limited land and soil resources** – Nauru is only 21 square kilometres in area, consisting of a single raised atoll. Most development is located around the narrow coastal plain. The island's elevated interior, which makes up over 70% of the land area, consists of coral-limestone pinnacles and limestone outcrops that have been the focus of intense phosphate mining since the early 1900s, with the result that most of the landscape is now unusable for settlement or agriculture. Consequently, there is very little, if any, land available for agriculture and critical infrastructure such as the power station, roads and hospital are all located in low lying coastal areas which makes them susceptible to flooding and inundation.
- **Environmental degradation** – Coastal erosion and water pollution have the potential to affect coastal fisheries and reef health, as well as groundwater quality. Loss of vegetation on the central plateau as a result of mining has left much of the landscape scarred, while rehabilitation is a long-term and uncertain project. The need to dispose of large volumes of waste is a major challenge to environmental sustainability since Nauru's population is currently swollen with the Regional Processing Centre (RPC).
- **High concentration of income-generating activities.** Over recent decades, earnings have been concentrated in the mining sector (which is contracting) and to a lesser extent in fisheries licenses. Revenue associated with the RPC for asylum seekers also provides an income stream, though is uncertain over the longer term. This narrow range of income-deriving activities makes Nauru's foreign earnings, which are critical for underpinning development, particularly susceptible to market changes as well as to the productivity of these resources. In the case of fisheries, the impacts of long term climate change may alter the productivity and/or location of key fish species, which makes Nauru's reliance on these resources for income even more precarious.

- **Dependence on imports** – The economy is reliant on a limited resource base and imports the majority of its fuel and food, making it highly vulnerable to external forces. Changes in global markets or terms of trade (currency exchange rate, for instance) can have a critical impact on livelihoods and the country's progress towards development objectives. This is particularly critical in the case of food, from a food security and also a health perspective, and also energy since imported oil is a major drain on revenue that could otherwise be used for tackling development priorities.
- **Geographical isolation** – The ability to access services elsewhere can be a useful coping strategy for when their delivery inside a community is constrained. Nauru's isolation, in terms of distance and the infrequency and cost of air transportation, makes accessing services in other countries very difficult. This isolation can magnify the effect of other stresses, for instance, it raises the costs of imports and exports, with consequent impacts on household expenditure and on government debt and budgets.
- **Low human capacity, linked to low levels of education** – Although primary school enrolment is almost universal, less than a quarter of adults have completed their secondary certificate and only 5% have a tertiary qualification. Finding staff with the appropriate qualifications and mixed skill base required to support Nauru with planning for climate change and disasters is therefore difficult. Keeping the limited capacity engaged in key sectors such as health or other government services is also a challenge. The Regional Processing Centre currently operating on Nauru also has the effect of providing an incentive for some employees to move from essential services, as young people are drawn to short term employment opportunities. Planning for longer term capacity development is thus a crucial need at this point.
- **Chronic health problems** – Nauru has one of the highest rates in the Pacific of non-communicable diseases (NCDs) such as diabetes. The National Health Strategic Plan 2010-2015 cites NCD's as the cause of 79% of deaths on the island¹, while obesity rates (above 70% for both males and females) are among the highest both regionally and globally. Life expectancy in Nauru is among the lowest in the Pacific region and appears to have declined over the last 1-2 decades. These problems are linked to diets that are dependent on processed imported food, and to sedentary lifestyles.
- **Aid dependence** – Being heavily dependent on foreign aid means economic capacity at the national level is dependent on the behavior of other countries, which makes Nauru vulnerable to possible future changes in the scale, type and direction of foreign aid flows.

Addressing these issues will help put Nauru in a better position to cope with and adapt to future conditions, and thus are a core part of our response to climate change.

At the same time, there are some specific risks posed by climate change or by potential disasters that could make our efforts to secure sustainable development even more challenging. Climate variability already significantly affects Nauru, particularly as a result of the El Niño Southern Oscillation (ENSO). Nauru's climate oscillates between El Niño events which tend to bring warmer, wetter conditions, and La Niña events that are associated with drier conditions and often result in extended drought. On past record droughts can last as long as 36 months, placing severe stress on the limited groundwater resources and on vegetation (leading to the death of non-coastal exotics and fruit trees such as breadfruit). This impacts heavily on the health and food security of communities, as well as on the economy as additional water from the energy-intensive desalination plant is needed to meet water demands. Drought periods also increase the risk of fires, which are potentially disastrous given Nauru's isolation and thus lack of access to alternative medical treatment, power, and water supplies.

Longer term climate change is projected to alter the country's biophysical environment, through an altered rate and distribution of rainfall, sea level rise and increased frequency of storm surges, higher air temperatures, higher ocean temperature and increasing ocean acidification². These changes will place greater stress on, for example, the quality and quantity of water resources, on health and on domestic food production, and pose risks to precious groundwater reserves and important infrastructure (much of which is situated immediately adjacent to the coast).

Changes elsewhere on the planet will also have an indirect effect on Nauru. The global production of, and market for, food will be affected as climate change impacts on water availability and on

¹ MOH, 2010

² PCCSP, 2011. Climate Change in the Pacific: Scientific Assessment and New Research, Volume 2. Country Reports: Chapter 8 – Nauru. Available at: <http://www.pacificclimatechangescience.org/wp-content/uploads/2013/09/Nauru.pdf>

temperatures. These changes will in turn have consequences for Nauru's ability to access essential food resources. To prepare for climate change, therefore, we need to take account of both direct and indirect factors that might undermine the country's development.

Compared to other Pacific islands, Nauru is not as vulnerable to natural hazards. Being close to the equator, Nauru does not experience tropical cyclones, although the island is subject to strong winds and sea swells. Situated in a very quiet seismic area, earthquakes are not a major threat, and although being located in the Pacific means tsunamis are a potential threat there are no historical records of earthquake or tsunami damage in Nauru. Nonetheless, given that most of Nauru's settlement and infrastructure is located on the coastal plain, tsunami preparedness is an important activity.

The main natural phenomena that pose disaster risks are drought leading to acute water shortages, and coastal erosion and flooding which threatens essential infrastructure. Inundation during heavy rainfall regularly disrupts transportation and other services, due to poor drainage.

Aside from acute water shortages and flooding, other disaster risks are most likely to be triggered by human activities, and many are exacerbated by Nauru's geographic isolation. Supply chain disruptions are a major risk, particularly for fuel which can lead to power shortages (and thus risks for critical service delivery such as the health sector) and for food. Fires are a hazard, since, given Nauru's isolation, damage to critical infrastructure such as the hospital or power station or fuel storage facilities can have serious repercussions. Other potential emergencies include civil unrest, public health crises (e.g. outbreak of communicable disease such as dengue), and fuel and oil spills.

1.2 What is CCA and DRR?

The term climate change adaptation (CCA) refers generally to a process aimed at reducing the vulnerability of people and ecosystems to external shocks, and to position them to take advantage of new opportunities that arise from changes. As a response to climate change specifically, this means preparing for the direct and indirect effects of future changes related to, for instance, more extreme weather events, sea level rise, increases in air and ocean temperature, and altered rainfall patterns. Importantly, the process of adaptation should also focus effort on improving the capacity of individuals, communities and ecosystems to cope with changes (sometimes referred to as building their "resilience") and to modify their circumstances where necessary. By addressing the factors that make people and ecosystems vulnerable in the first place, adaptation can lessen the risks posed by climate change as well as by other stresses such as potential disasters.

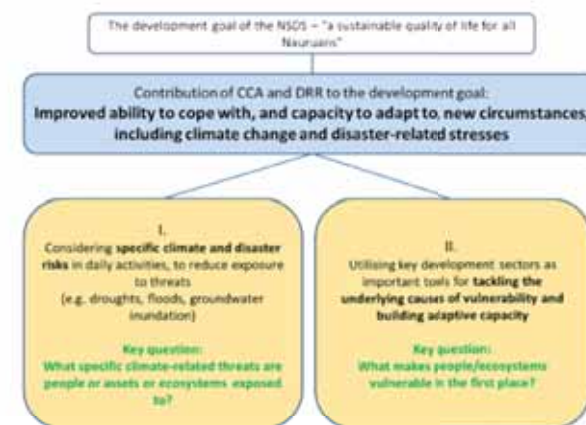
The term disaster risk reduction (DRR) is part of the broader field of disaster risk management (DRM). DRM includes both risk reduction measures as well as disaster management and emergency response (which is focused on preparing for and responding to individual disaster events). Like CCA, the notion of DRR is cross-cutting. Risk reduction should be considered and implemented across sectors and activities – that is, it is not the responsibility of a single agency but rather should be "mainstreamed" into broader social and economic development.

These two ideas are represented in Figure 1. In practice, what this means is that CCA and DRR might consist of different kinds of activities in each sector:

- Key assets or services might be vulnerable to specific climate change impacts or potential disaster events, therefore some priorities respond to specific threats or hazards. This for example could cover issues such as the additional flood risks to a hospital; and
- Addressing some of the main development challenges in each sector is critical to lessening overall vulnerability and to increasing adaptive capacity, at the individual, community and national level. Therefore, some adaptation priorities emphasise the reinforcement or strengthening of key development priorities. For example, education levels can greatly influence people's ability to access information necessary to reduce risks associated with climate change and disasters. Investing in education can therefore be seen as a long term risk reduction strategy.

The term "resilience" is used throughout this document, referring to the ability of communities and ecosystems to cope with, withstand and absorb stress. Resilience as a goal does not imply there is no need to change or to build the capacity of community to make changes. In fact change, or

Figure 1. The two pillars of CCA and DRR



"adaptation", is essential if Nauru's people and ecosystems are to become more resilient both to current challenges as well as to future challenges such as intensifying climate change and potential disaster events.

Similarly, future social, economic and environmental conditions are uncertain, therefore building the capacity of people to be able to react in future – sometimes called "adaptive capacity" – is also a crucial part of building long-term resilience.

1.3 Rationale for a joint CCA and DRR framework

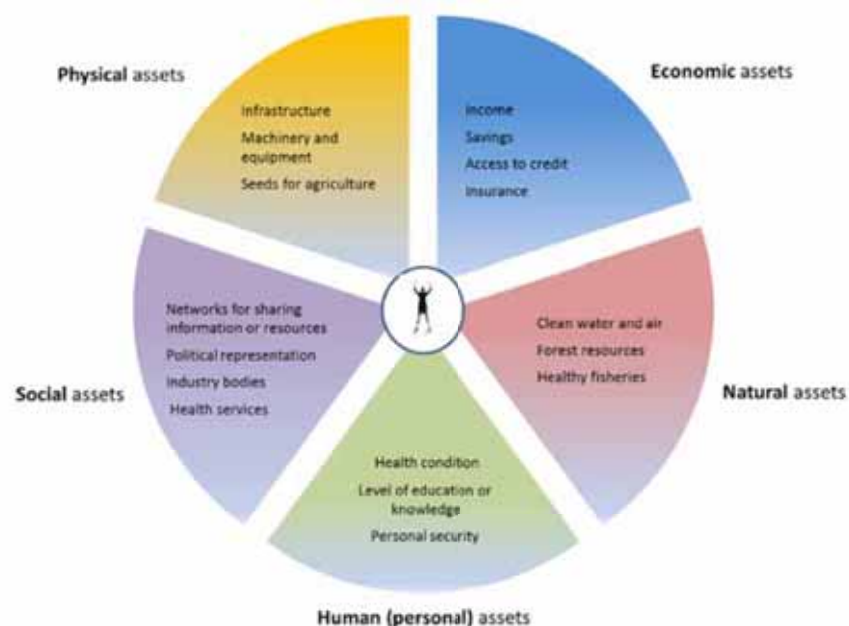
Although climate change adaptation and disaster risk reduction are not the same thing, CCA and DRR do share two important characteristics which provide the logic for linking them in a joint national framework.

Firstly, both are concerned primarily with reducing vulnerability and/or risk, of people and ecosystems, to external shocks and changes. Vulnerability is the product of many social, financial, economic, biophysical and individual factors together, particularly related to people's access to different kinds of resources or assets – economic, natural, social, physical and personal assets such as health and education levels (see Figure 2). Both climate change and disaster events can increase vulnerability, for example by introducing new stresses such as extreme heat or more severe storms, or by causing the deterioration of the basic elements that are essential to people's livelihoods such as fisheries or agricultural resources, or water supply. In other words, climate change and disaster events may increase vulnerability, by exacerbating current problems or creating new ones. This means that CCA and DRR responses can and should think about how to most effectively prepare people and ecosystems for a wide range of future changes, as well as reduce exposure to specific high-consequence hazards.

Therefore, the practice of both CCA and DRR means an effort is required to understand who is vulnerable and what makes them vulnerable in order to determine what response would be most effective.

At the same time, both adaptation and disaster risk reduction also implicitly acknowledge that risk is part of everyday life, and thus social development is a crucial part of the strategy for ensuring people have the capacities needed to manage risk.

Figure 2. Vulnerability and resilience is influenced by access to different kinds of assets³



Secondly, both CCA and DRR must work with a high degree of uncertainty. Projections of future climate change are proving more and more robust at the global scale, however the type and particularly the magnitude of impacts that will be observed in specific locations are still uncertain, particularly for a country as small as Nauru. On the disaster side, the type and magnitude of future disaster events are difficult to predict. For example, while Nauru has no historical record of tsunamis, this does not mean there will be none in the future. Also, the fact that climate change introduces new forms of risk means historical accounts of disasters are less robust as predictors of future events.

Uncertainty raises the prospect of decisions now not only being redundant but, in the worst case, also increasing the vulnerability of people and systems or reducing their capacity to make changes, sometimes referred to as “maladaptation”. Uncertainty about future conditions makes it sensible for CCA and DRR to place a strong emphasis on building Nauru’s capacity to make sound long-term decisions, on filling knowledge and information gaps, and on tackling the underlying causes of vulnerability – in other words, not just focusing on short-term climate variability as the main focus. It also means it is sensible to focus on “no-regrets” adaptation and risk reduction activities, which are those that also deliver co-benefits in terms of development goals or environmental protection.

Overall, these shared characteristics means it is useful to consider CCA and DRR needs in tandem, particularly to “mainstream” or integrate them into national and sectoral development planning. If planning for risk and vulnerability reduction is done in an integrated manner, this can also ensure synergies for both CCA and DRR outcomes. It is also a good opportunity to mainstream other cross-cutting issues such as social inclusion.

1.4 Objectives of RONAdapt

The RONAdapt is intended to support progress towards the country’s national development priorities and environmental sustainability, by ensuring that a focus on reducing vulnerabilities and risks is incorporated into national and sectoral planning. It provides guidance to planners and practitioners about the problem (vulnerability and risk) and on how to identify effective solutions that support adaptation and risk reduction at the same time as supporting Nauru’s development priorities.

- Firstly, it describes a series of CCA and DRR priority actions. These are a combination of both:
- Specific activities “on the ground”, arranged in the document into a number of “high priority” actions as well as others by sector (even though some outcomes in fact cut across multiple sectors).
 - Policy and institutional strengthening activities, integrating CCA and DRR as important components or national and sectoral development strategies.

These priorities provide a basis for development partners to engage with the Government of Nauru on CCA and DRR activities, and in doing so should ensure greater coherence with Nauru’s own priorities. Expectations for future engagement with development partners is described in Section 5.

Secondly, it provides guidance for longer term planning in Nauru. The RONAdapt establishes a general guiding framework for considering climate and disaster risks in national and sectoral planning processes. It clarifies the principles upon which planning for resilient development should be based, to guide decision makers in government and among the community. It also articulates responsibilities across government for mainstreaming climate change adaptation and disaster risk reduction into sectoral activities. In this regard, RONAdapt should be used by climate change and disaster focal points, as well as by line agencies, to assist in the development, review and implementation of sectoral policies and plans. Priority actions identified in Section 4 should be integrated into these plans when the opportunities arise, if not already.

- The remainder of the document proceeds according to the following structure:
- Section 2 sets out six key principles that will guide adaptation and risk reduction activities in Nauru.
 - Section 3 describes the current national context, referring to Nauru’s international commitments, its national priorities under the NSDS, its array of sectoral policies and plans, and the role of RONAdapt in supporting these.
 - Section 4 presents a series of near-term priority actions for CCA and DRR. These were identified by an iterative process of stakeholder consultations (described in Annex 1).
 - Section 5 sets out the implementation arrangements, including the institutional framework of ministerial roles and responsibilities for ensuring CCA and DRR are effectively integrated into national development policies, plans and budgeting processes, and the monitoring and evaluation strategy for RONAdapt itself.

- The outcomes of successfully implementing the RONAdapt will be:
1. **Reduced vulnerability** of Nauru to external stress, and improved capacity to cope with and respond to climate change and disasters.
 2. **Better mainstreaming** and consideration of climate change and disasters risks across all sectors of the economy, into the activities of the government and communities, including into national and sectoral plans.
 3. **Improved coordination** between stakeholders at the national level and between the government of Nauru and its development partners, ensuring future collaboration aligns with Nauru’s priorities for building resilience and avoids duplication.
 4. **Enhanced capacity** to plan and implement CCA and DRR measures.

³ Source: adapted from the Sustainable Livelihoods framework (see DFID, 1999) <http://www.eldis.org/vfile/upload/1/document/0901/section2.pdf>



2. KEY PRINCIPLES FOR CCA AND DRR PLANNING IN NAURU

CCA and DRR should not consist of a set of separate activities or priorities. Building resilience means integrating the goals of vulnerability- and risk-reduction into the planning, design and implementation of key development policies and activities. CCA and DRR efforts should be designed so as to encourage efficient and effective resource use and where possible maximizing the creation of co-benefits for development and environmental sustainability.

The following six principles will guide the consideration of CCA and DRR activities in Nauru – both the priorities identified in this document, as well as the way development planning in future should integrate vulnerability and risk reduction:

- 1. CCA and DRR should focus on vulnerability in its holistic sense.** In other words, focus should be on addressing the underlying factors that make people vulnerable, rather than only on specific climate/disaster risks, and on building the capacity of people and ecosystems to adapt in different ways.
- 2. The perspectives of the most vulnerable people should be incorporated into planning and priority setting.** This includes understanding the way vulnerability might be influenced by variables such as gender, age, marital status, physical health and mobility, income levels, housing location, religion, and educational background, amongst others. It also means enabling women and children, as well as other potentially vulnerable groups, to meaningfully contribute to CCA and DRR planning. This principle should prompt planning and decision making processes to think about what might make people vulnerable in a particular context, and to avoid assuming vulnerability is evenly distributed.
- 3. Climate change adaptation and disaster risk reduction should be linked to – and support – other social, economic and environmental policy objectives.** In other words, adaptation and disaster risk reduction activities should be aligned with and reinforce national development and environmental priorities, and aim to maximise co-benefits. Strengthening sustainable development and environmental health will improve Nauru’s capacity to cope with, and adapt to, future risks including those arising due to climate change and/or disasters.
- 4. Responses should be integrated across sectors.** This means not concentrating exclusively on sector-specific risks but thinking and responding in a more coordinated manner. For instance, activities in education can be an important tool for accomplishing objectives related to health or water; activities in the water sector can deliver important outcomes for health or for energy security. Activities in the water, waste and infrastructure sectors can have benefits for coastal fisheries. A high degree of communication and coordination between different parts of the government is thus essential during planning, and sometimes during implementation of activities.
- 5. Potential indirect effects that could arise due to climatic change and/or the introduction of climate policies internationally should be considered.** National and sectoral planning should consider the potential for indirect risks, in addition to projected biophysical changes in the immediate vicinity of Nauru itself. This includes, for instance, the potential for global price increases for key commodities to create local problems given Nauru’s dependence on imports for food and energy in particular. Therefore, increases in local food production, renewable energy, and energy efficiency and conservation are critical strategies for reducing vulnerability.
- 6. To reduce the significance of uncertainty about future climate change, emphasis should be placed on strengthening the capacity of individuals, institutions and communities to be able to understand and react to different kinds of future changes.** Some adaptation measures or responses will necessarily focus on tackling specific risks that are projected for Nauru. However, because we cannot know exactly how the future will be, we must also ensure that individuals, institutions (including government and policies) and communities are able to react to unexpected changes too. This is sometimes referred to as “unplanned” adaptation. In essence, this means supporting people’s ability to access the different kinds of assets referred to in Figure 2, since these are what give people the capacity to take action. The priorities articulated in Section 4 of the RONAdapt are a mix of planned adaptation and DRR measures and capacity strengthening to manage unexpected impacts as they arise.



3. NATIONAL CONTEXT FOR CCA AND DRR

3.1 International and regional engagement

The RONAdapt responds, in part, to various commitments made by the Government of Nauru towards implementing several international processes and agreements related to CCA and DRR.

Nauru ratified the UN Framework Convention on Climate Change (UNFCCC) in 1993 and the Kyoto Protocol in 2001. The Government has taken concrete steps to ensure compliance with the obligations under these international conventions. The country's First National Communication was submitted to the UNFCCC in 1999, and its Second National Communication is under development. Nauru also participates in regional climate change meetings, including of the Pacific Climate Change Roundtable which monitors the implementation of the Pacific Island Framework for Action on Climate Change (PIFACC) providing the overall regional agenda for responding to the challenges of climate change.

In 2014, the Government of Nauru committed to the Small Islands Developing States Conference (SIDS) and actively participated in the development of the post-2015 cooperation framework for the Barbados Program of Action and Mauritius Strategy. Nauru has demonstrated this commitment through their current chairmanship of the Alliance of Small Island Developing States (AOSIS) and their position on the United Nations Open Working Group on the Sustainable Development Goals.

Mainstreaming DRR is an important government commitment, reflected in its endorsement of the Hyogo Framework for Action: 2005-2015 'Building the Resilience of Nations and Communities to Disasters' (HFA) and the Pacific Regional DRM Framework. Adopted by Nauru in 2005, the HFA is a 10-year plan that describes what is required from different sectors and actors to reduce disaster losses. The Pacific Disaster Risk Reduction and Disaster Management Framework for Action 2005 - 2015 (RFA) was endorsed in October 2005. Adapted from the HFA, the RFA reflects an "all hazards" approach to disaster risk reduction and disaster risk management, in support of sustainable development.

As a response to these commitments, Nauru introduced the Disaster Risk Management Act 2008 and in 2010 established the National Disaster Risk Management Office (NDRMO) to coordinate day to day activities. A National Disaster Risk Management Plan was drafted in 2008, but has not been endorsed. However there remains a considerable amount of work to implement these international and national commitments and to further mainstreaming DRR across national and sectoral development plans and activities.

In 2013, a Joint Meeting of the Pacific Climate Change Roundtable and the Pacific Platform for Disaster Risk Management encouraged greater linkages between responding to climate change, reducing disaster risks, and the pursuit of sustainable development. At the regional level, this has culminated in development of the Strategy for Climate and Disaster Resilient Development in the Pacific (SRDP), due for finalisation in 2014, which emphasises actions to enhance resilience, while alleviating poverty and thereby ensuring more sustainable development.

3.2 National policy context

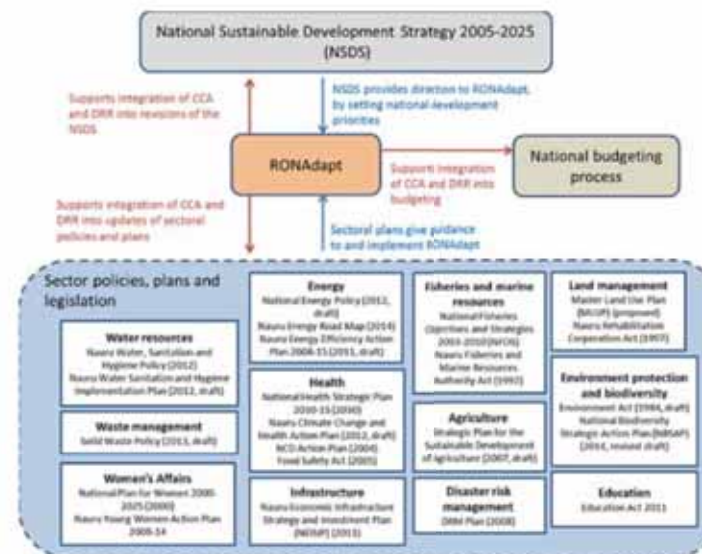
The RONAdapt is aligned with the development priorities embedded in the National Sustainable Development Strategy 2005-2025 (NSDS), which outlines Nauru's overall development vision: a future where individual, community, business and Government partnerships contribute to a sustainable quality of life for all Nauruans. The NSDS articulates five goals:

1. Stable, trustworthy, fiscally responsible government
2. Provision of enhanced infrastructure and utilities services
3. Development of an economy based on multiple sources of revenue
4. Rehabilitation of mined out lands for livelihood sustainability
5. Development of domestic food production

The NSDS establishes a vision for Nauru's future, identifies economic development options, and prioritises activities with which development partners could potentially engage. It identifies as cross-cutting issues: (i) environmental damage and rehabilitation, (ii) climate change and natural disasters, (iii) preserving the natural environment and biodiversity, and (iv) food security. In addition, an array of sector-based themes are highlighted as important for sustainable development, including fresh water, land resources, energy, coastal and marine resources, health, education, waste, transport, and agriculture.

RONAdapt is intended to support achievement of the NSDS goals, by highlighting a series of actions that – if successfully implemented – will reduce Nauru's vulnerability to climate change and to potential disasters. In doing so, it will improve the country's social, economic and environmental resilience. It gives priority to actions that implement or work towards goals in the NSDS, as well as those in sectoral plans and strategies where these already give consideration to climate change and disaster risks. Importantly, it also provides a platform from which future revisions of key national and sectoral plans can integrate consideration of climate change and potential disasters. RONAdapt therefore gives impetus to the NSDS but also provides a lens for its further development and revision. Figure 3 indicates the functional relationship between the NSDS, RONAdapt, sector policies and plans, and national budgetary processes. Note that RONAdapt should also inform annual operational plans in the way it does sectoral policies and plans.

Figure 3. Relationship between the NSDS, RONAdapt and sector policies and plans





4. PRIORITY ACTIONS TO SUPPORT CCA AND DRR

4.1 Over-arching resilience goals

The priorities outlined in the RONAdapt are intended to contribute to the achievement of the NSDS and to increasing Nauru's resilience to climate change and disasters, by targeting the following goals:

1. Water security
2. Energy security
3. Food security
4. A healthy environment
5. A healthy people
6. Productive, secure land resources

Achieving these requires a mix of the types of actions described below.

4.2 Priority actions

This section describes Nauru's near-term CCA and DRR priorities. Several different kinds of activity are given priority here.

Firstly, some actions are intended to reduce a particular risk that is already posing a challenge for Nauru and which is likely to become more challenging as a result of climate change or potential disasters. Responses to water insecurity and coastal erosion are examples of this.

Secondly, some actions are intended to address some of the more general, chronic problems that currently affect Nauru, since these make the country's people and ecosystems more vulnerable to the impacts of climate change and potential disaster events. As already highlighted, many of the key development sectors are not only themselves vulnerable to climate change, but are also an important tool for building social, economic and environmental resilience. Activities to improve health outcomes, agricultural production and energy security are examples of this.

Thirdly, planning and management in many sectors is constrained by poor information about current conditions and/or likely future changes. Filling information gaps is therefore a key activity common to most sectors described below, which is necessary to support future adaptation and risk reduction responses. These should be supported by strong information and knowledge management systems.

Finally, some activities to address policy, planning and/or institutional gaps or weaknesses are emphasised, which are needed if Nauru's long term resilience is to be built. At present, some sectors lack detailed development plans, while other plans exist but are either still in draft form, out of date, or do not sufficiently integrate vulnerability and risk reduction. Institutional strengthening activities consist of steps that the government needs to take to ensure suitable legislative and policy frameworks are in place to support implementation of CCA and DRR activities.

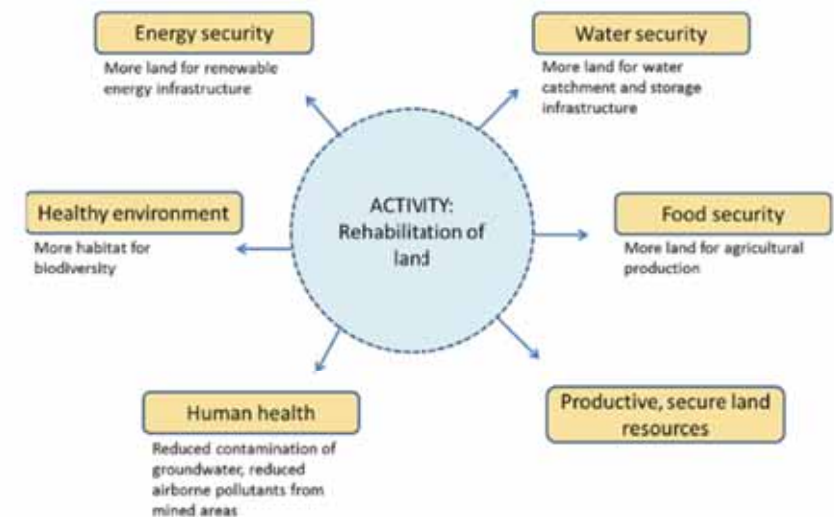
The RONAdapt is a five year plan of action, which means the priorities emphasised here are near-term actions identified through current assessments of need. Further priorities are expected to emerge over time as Nauru increases its capacity to respond to vulnerability and risk. At this stage costs are not provided, since there is insufficient detail on individual activities to be able to accurately indicate costs. The preparation of detailed cost estimates is an important next step in implementing each activity, and is expected to be undertaken in conjunction with the process of detailed design of the activities (see Section 5.1). In some sectors, more specific sub-activities have been formulated and can be found in the relevant sectoral strategies and action plans.

The process by which RONAdapt was developed, and its priorities identified, are summarised in Annex 1. This was a cross-government process involving a wide array of departments and sectors. It also took account of existing sectoral policies and plans where these have been developed.

Although presented in the RONAdapt under sectoral headings, high priority actions are those that can contribute towards multiple development and resilience objectives simultaneously, often cutting across sectors. For instance, Nauru's vulnerability to food and water stress is affected in part by the prevalence of chronic health problems that reduce people's ability to cope during times of hardship. These health problems are related in part to diet, and to the heavy reliance on imported foods. An important strategy for tackling non-communicable diseases such as diabetes is improving local agricultural production, to grow more fresh food for the local market. This means activities and outcomes in the health and agriculture sectors are linked. Furthermore, efforts to expand agricultural production rely on improving water security, therefore agricultural and water sector outcomes are also linked. In fact, addressing water security has important benefits for many other sectors – agriculture, health, coastal zone management, fisheries, disaster risk management, and energy – and hence is a key priority to tackle as part of Nauru's CCA and DRR strategy.

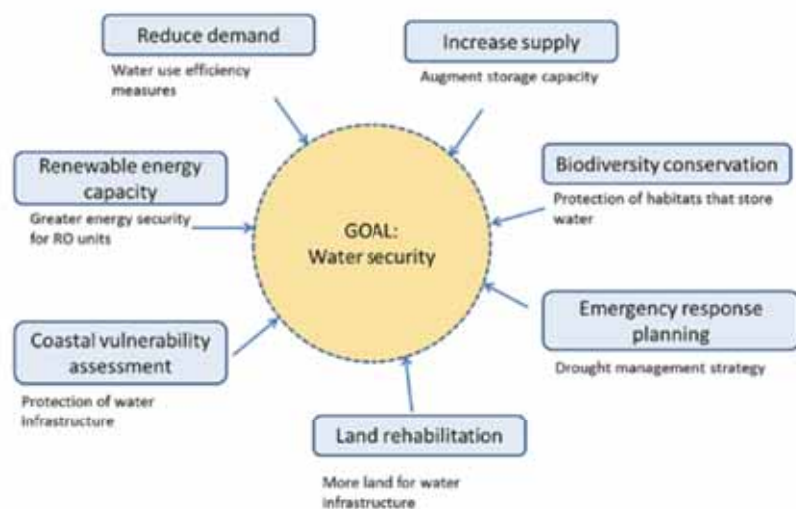
Figures 4 and 5 illustrate the cross-cutting nature of priority actions, specifically the ways in which (a) a specific activity often contributes to more than one goal, and (b) many activities from different sectors can contribute towards a common goal. The RONAdapt framework thus consists of a web of actions that are designed to simultaneously address Nauru's resilience goals.

Figure 4. One priority activity contributes to multiple goals



⁴ The Nauru Climate Change Finance Case Study (PIFS, 2013) presents an analysis of funding sources, institutional structures, and policy and planning processes related to climate change. Some of the recommended institutional actions described below were also highlighted by the case study report.

Figure 5. One goal is progressed through activities in different sectors



CCA and DRR priority actions are summarised in Table 1 below, arranged under sectors – even though, as described above, the actions generally contribute to the goals of multiple sectors at the same time. The rationale for the actions, and further details about them (including lead agencies responsible for implementation), are presented by sector in Annex 2.

Table 1. Summary of CCA and DRR priority actions

Strategy	Activities
Water	
Fill information gaps and increase access to baseline information about the water sector	Conduct a National Water Audit Set up a coordinated water resources and sanitation monitoring and reporting system , linked to a centralised data base and furnished with input from a regular data collection program
Increase water supply and storage capacity	Prepare a 20-year infrastructure investment, maintenance and replacement program Increase production capacity of the reverse osmosis units Increase capacity for public rainwater collection and storage, through targeted investments in new public rainwater infrastructure , at community and national level Develop and implement a program to reduce unaccounted-for water and water losses from desalination system Augment national water storage capacity , in order to be used for storage of treated water from desalination plants

Reduce water demand	Introduce incentive programs and technologies for water use efficiency at the household and business level Amend water pricing regime to increase cost recovery for water supply Develop a public education, communication and behaviour change strategy around water use issues , to increase capacity, raise awareness and encourage participation in conserving and protecting water sources
Rehabilitate and protect groundwater resources	Introduce incentive programs for moving to improved sanitation systems that minimise groundwater pollution and reduce potable water use for flushing
Disaster and contingency management for water sector	Develop early warning system for extreme seasonal weather and climate events relevant to water supply, such as changes in the ENSO system
Health	
Fill key knowledge and awareness gaps to reduce community health risks, including those relating to the impacts of climate change	Undertake an epidemiological study of the expected changes in climate-sensitive diseases in Nauru (e.g. dengue fever, diarrhoeal disease) Strengthen health-related information systems (data collection, collation, analysis) and improving staff capacity in the areas of biostatistics and epidemiology Progress community education, health promotion and awareness-raising , integrating climate and disasters-related health issues
Reduce chronic health problems of the community	Implement NCD Action Plan
Expand environmental monitoring capacity	Establish a vector-borne disease control unit under the Environmental Health unit. Introduce monitoring and surveillance of climate- and disaster-related health risks, including of key illness/disease vectors: water quality, mosquitoes, food, ocean temperatures and incidence of marine toxins, mycotoxins and pathogens in aquaculture/fisheries, and animal testing as needed
Build human capacity of health services	Train health officials in identifying symptoms and early treatment options for water-borne diseases
Secure key health infrastructure and services against extreme events	Develop/update (if needed) emergency management plan that addresses critical health sector needs (e.g. water for dialysis patients during extreme events, critical patient relocation) Conduct training programmes and information campaigns on emergency management for health sector staff
Agriculture	
Improve water security for agricultural needs	Invest in dedicated water storage to ensure supplies available during droughts Introduce more efficient water use practices , including simple irrigation systems such as “bucket irrigation” and the use of recycled and grey water for irrigation Introduce and promote drought tolerant crop varieties and resilient livestock breeds Encourage use of shade for crops to reduce evaporation, and fodder crops for livestock breeds (to reduce the need for imported livestock feed)

Increase household engagement with agriculture and livestock	Support community and household education and training in kitchen gardening Encourage house-hold production of livestock (pigs and chickens) for meat and eggs, and improved livestock husbandry practices to cope with the effects of drought Encourage greater consumption of local produce (a goal of the NSDS), through community awareness and behaviour change campaigns
Improve grower skills and practices, to increase productivity and make crops less vulnerable to extreme events such as drought	Engage growers in the documenting of best practice examples. Include guidance on the use of composting and mulching to improve soil fertility and moisture retention, incorporate knowledge from traditional practices, and management options for responding to extreme events such as droughts or heavy rainfall periods. Encourage further development of domestic nurseries to propagate planting material and improve growing stock by nurturing and distributing appropriate crop varieties (e.g drought tolerant plant varieties). Introduce livestock best practices to increase production, including housing, feed , and encouragement of climate-resilient breeds. Improve seasonal forecasting and grower access to weather and climate information to enable growers to adapt the type or variety of crop planted.
Fisheries and marine resources	
Fill knowledge gaps – Identify and document vulnerable fisheries and marine resources	Collect and analyse fisheries and marine resources data in conjunction with assessments of climate change and disaster impacts on coastal resources, including programs for regular monitoring of fish resources Development of effective monitoring, control and surveillance (MCS) capability , through national programmes and regional cooperation
Support a community based ecosystem approach to fisheries management (CEAFM)	Strengthen the community fisheries program of NFMRA, to support CEAFM. Develop integrated fisheries management plans , through community consultation, which integrate future changes and risks due to climate change
Promote aquaculture as an important contributor to food security that can reduce pressure on coastal fisheries	Assess the impact of drought on aquaculture and develop management tools Investigate contamination of Buada lagoon from the waste dump site, and determine strategies to prevent further contamination Finalise an action plan for aquaculture development
Strengthen the human capacity of government and community stakeholders	Promote and facilitate human resource development through fisheries education and training programmes , increasing local capacity in marine science, fisheries techniques, monitoring and analysis of resources, coastal and marine resource management practices, and seafaring Increase local capacity to support aquaculture expansion

Disaster management and emergency response	
Improve community preparedness and response systems	Implement a community outreach strategy to develop and maintain high levels of community awareness and preparedness for responding to extreme events Establish a multi-hazard early warning system for disaster events Build the capacity of response agencies (Fire, Police, Ambulance, Marine Search and Rescue)
Fill knowledge gaps and ensure access to information	Compile vulnerability assessments for Nauru relating to disaster risk, climate change and climate variability, as the basis for identifying future priority actions
Energy	
Reduce electricity demand for water	Identify opportunities for electricity savings from water pumping and reverse osmosis units, and by reducing leakages in the reticulation, delivery and storage systems /tanks
Expand renewable energy capacity	First tranche of solar energy capacity expansion . Initially to be progressed through: <ul style="list-style-type: none"> • Preparation of a Solar Feasibility Study and technical standards and specifications for all phases of solar installations; • Identification of potential sites for solar, including survey of roofs of government owned buildings, power poles and other spaces for solar PV, and locating land “Topside” for large scale solar plants; and • Tendering for, and installation of, the first 600 to 1000 kWp of grid-connected solar without storage.
Reduce transport fuel use while ensuring mobility	Design and introduce incentives to increase the use of bicycles and motorcycles for personal transport , as well as car-pooling and other behavioural changes to encourage energy efficiency
Improve local capacity for managing and maintaining a sustainable energy sector	Facilitate development of appropriate local skill base to meet future demand in the energy sector through various forms of training in energy efficiency and renewable energy . Includes building capacity to install, operate and maintain solar PV systems
Reduce risk of major fire outbreak at tank farm	Upgrade and expand fire protection system for tank farm area
Land management and rehabilitation	
Increase availability and productivity of land resources	Continue to implement effective land rehabilitation of Topside, in order to increase long-term availability of land for agriculture, settlement, infrastructure, and social services (e.g. cemeteries). Plant coastal vegetation such as salt bush trees to protect vegetation from wind and salt spray, and to reduce soil erosion. (co-benefit for agricultural production).
Improve waste management to reduce land degradation and contamination risks	Identification of new landfill site , and preparatory work to design, construct and commission. Train local livestock farmers on animal waste management technologies to reduce the risk of public health risks and environmental pollution.

Infrastructure and coastal protection	
Reduce coastal risks to key infrastructure	<p>Conduct coastal vulnerability assessment and mapping, with a strong focus on community involvement, to identify key infrastructure at risk from coastal hazards and identify options to reducing risks (also in Coastal Management section). Assessment of coastal activities and management practices, as well as biophysical coastal processes, as a platform for making informed coastal management decisions.</p> <p>Develop an Integrated Coastal Zone Management Plan, as part of a Nauru Land Use Plan, identifying priority areas for reinforcement/protection, adjustments in land management, and possible relocation needs for specific high risk assets.</p>
Reduce flooding occurrence and intensity	<p>Develop and implement heavy rainfall and local flooding contingency plans.</p> <p>Design and construction of drainage infrastructure, to reduce flood risks in critical locations.</p>
Biodiversity and environment	
Designate areas for conservation of biodiversity	<p>Land use planning to identify and protect areas of high conservation value. Establish conservation areas in partnership with the community.</p> <p>Encourage breeding of resilient indigenous livestock species, especially of pigs and poultry.</p>
Protection of flora and fauna	Implement programmes for the eradication and control of invasive species
Community development and social inclusion	
Take greater account of gender in planning	<p>Introduce gender budgeting and gender analysis at the national level. This provides a breakdown of how resources are benefiting men and women and is a tool for helping to ensure the most vulnerable are given priority.</p> <p>Introduce a requirement for gender budgeting in all future projects supported by development partners.</p> <p>Support more widespread use of gender disaggregation in national and sectoral data collection programs, for instance in assessments of vulnerability or disaster losses, land ownership, formal and informal labour participation, and energy usage.</p>
Strengthen communities	Continue to implement the strategies of the Ministry of Home Affairs, focusing on women's affairs, family and community services, youth affairs, and the preservation of culture and language .
Education and human capacity development	
Skills transfer to local Nauruans during development projects	Require that all development partners specifically build a skills transfer component into projects and programmes which they support in Nauru.

4.3 Institutional strengthening priorities

In addition to the priority actions, some general cross-sectoral priorities are also important to raise. While not specific "actions" in themselves, these are steps or issues that need to be supported for effective CCA and DRR responses in Nauru. Important cross-cutting uses raised in the NSDS (2009) include:

- Public administration – Strengthen and develop the institutional capacity of the Nauru Public Service.
- Governance institutions – Strengthen Parliament, Audit, Justice, Law, Order and Border Control.
- Land – A transparent and fair land management system that supports social, economic and private sector development.
- Environment – Sustainable use and management of the environment and natural resources for present and future generations.

These are all important priorities that will influence how successfully or not Nauru is able to build its resilience to climate change and potential disasters.

Institutional strengthening activities are necessary across most sectors. This includes the finalisation of an array of policies and plans that have only been progressed to draft form. Individual ministries are responsible for progressing these to Cabinet.

In addition to those mentioned specifically here, other activities are also important to implement. In particular, financial reform, or improved transparency and accountability in financial management, is a critical step in making Nauru more resilient to climate change and potential disasters. This relates to better information, decision making about how resources are used and better planning and reporting. This means Nauru is able to make more effective use of the limited resources it has available to address climate change as well as its many development challenges.

Table 2: Key institutional strengthening activities

Sector	Institutional strengthening priorities
National development	<ul style="list-style-type: none"> • Integrate CCA and DRR into revision of the NSDS
Water	<ul style="list-style-type: none"> • Develop a 20 Year <i>Water and Sanitation Master Plan</i> to guide planning, including investment in and maintenance of infrastructure, and which specifically integrates climate variability, climate change and disaster risk considerations. • Finalise and endorse the <i>Drought Management Strategy</i>
Health	<ul style="list-style-type: none"> • Endorse the 2009 <i>Public Health Bill</i>, which is currently still in draft form. • Finalise and endorse the <i>National Climate Change and Health Action Plan (NCCHAP)</i>. • Incorporate climate change and disaster related considerations into the upcoming revision of the <i>National Health Strategic Plan</i>. • Finalise and endorse the <i>Food Safety Regulations</i>, to give regulatory backing to the <i>Food Safety Act</i>. • Update and endorse a revised <i>Environment Act</i> (still in draft form). • Strengthen human capacity in the health and medical services sector, particularly the development of trained Nauruan staff.

Agriculture	<ul style="list-style-type: none"> Develop human capacity within both government and the community through dedicated skills training programs. Update and strengthen enforcement of the <i>Agricultural Quarantine Act (1999)</i>. Endorse Food Safety regulations (as mentioned in the Health section), to protect agriculture in Nauru from pests. Fruit fly incursions have previously destroyed crops, and improved inspection and quarantine practices will help protect Nauru from further incursions.
Fisheries and Marine Resources	<ul style="list-style-type: none"> Updating and strengthen the key legislative and policy frameworks governing Fisheries and Marine Resources, namely the <i>Nauru Fisheries and Marine Resources Authority Act 1997</i> and associated regulations, taking account of possible changes in fisheries resources as a result of climate change. Strengthen Nauru's skills in trade negotiations to achieve greater capitalisation of economic benefits from fishing beyond the territorial sea.
Disaster Management and Emergency Response	<ul style="list-style-type: none"> Update and finalise the <i>Disaster Risk Management Plan 2008</i> and review the DRM Act (not least because institutional arrangements for DRM have changed since 2008, for instance with the establishment of the NDRM Office in 2010). Strengthen and broaden the human capacity of the NDRMO and of the Climate Change Unit. Develop clear national plans and guidelines for emergencies, including procedures to mobilise and coordinate emergency relief. This includes finalisation and implementation of the Drought Management Strategy. Re-establish the national coordination centre for emergency response. Under the DRM Act 2008 responsibility was designated as being with the Police, however since then responsibilities have changed. Furthermore, the police coordination centre is physically located by the coast, which is itself vulnerable during extreme coastal events.
Energy	<ul style="list-style-type: none"> Develop a legislative and governance framework for the energy sector. Develop supporting regulations for the NUC Act. Establish and staff an energy unit within the department of CIE.
Land management & rehabilitation	<ul style="list-style-type: none"> Prepare a whole-of-island <i>Nauru Land Use Plan</i>, integrating the proposed Master Land Use Plan for Topside and the proposed Integrated Coastal Zone Management Plan (see below).
Infrastructure and coastal protection	<ul style="list-style-type: none"> Develop and implement an <i>Integrated Coastal Zone Management Plan (ICZMP)</i>, which integrates climate and disaster risks. Develop a Code of Practice for coastal structure design and engineering, including clarity around the environmental assessment process for new development. The code should also support consideration of climate- and disaster-related risks in infrastructure planning. Establish a task force, and then coastal zone management unit in the department of CIE (with close working links to NFRMA) which can build government capacity and coordinate the resources needed to sustainably manage Nauru's coastal zones. Integrate a recognition of potential climate change and disaster impacts, and thinking about vulnerability and risk reduction, into future updates of the NEISIP. Support human capacity development in maintenance and management of core infrastructure assets.

Biodiversity and environment	<ul style="list-style-type: none"> Finalise the revised <i>National Biodiversity Strategic Action Plan</i>. Update and formally endorse the <i>Environment Act</i>. Develop, adopt and enforce Environmental Impact Assessment (EIA) legislation. Strengthen facilities and procedures for border control and quarantine services.
Community development and social inclusion	<ul style="list-style-type: none"> Finalise and implement the Women's Policy. Develop nationally suitable template for gender budgeting, and train staff from Finance and other departments in how to implement gender budgeting.

Building human capacity

The government will at times rely on technical expertise and resources from development partners and Council of Regional Organisations in the Pacific (CROP) agencies during these processes. However, it is also important in the longer term to develop local human capacity to plan and implement CCA and DRR, and more generally social and economic development.

To build resilience, skills are required in complex decision making, technical and applied skills such as engineering, financial management capacity, coordination and communications, the capacity to fulfill essential services such as health and energy provision, and skills in agricultural production and fisheries management⁵. Capacity to understand and assess vulnerability, and how different factors (such as gender) affect vulnerability of individuals and households, is also needed to help prioritise future resource use.

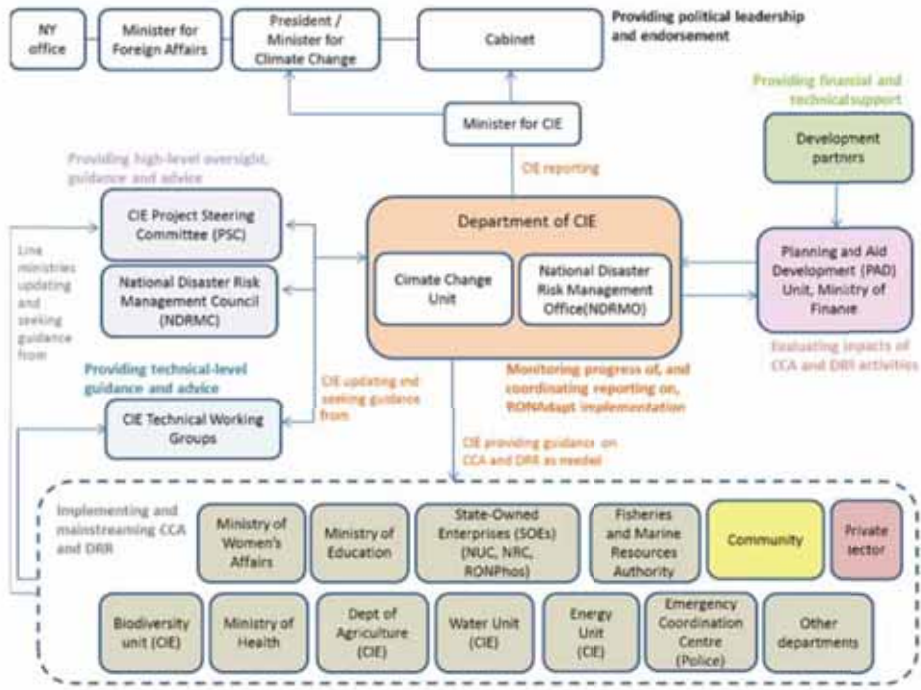
No one entity is responsible for developing and maintaining this capacity, instead many stakeholders need to be involved – from government (e.g. education, line ministries), to community organisations (e.g. church-based groups, youth groups including the National Youth Council, and environmental groups such as 350.org) and regional organisations (e.g. Secretariat of the Pacific Community, Secretariat of the Pacific Regional Environment Programme, University of the South Pacific). The way in which development partners might strategically support this objective is described in Section 5.



⁵ The Nauru National Assessment Report for the Third International Conference on Small Island Developing States, May 2013, highlights Nauru's "limited technical capacity in science and technology".



Figure 6. Roles and responsibilities for implementing CCA and DRR and the RONAdapt



5. RONADAPT IMPLEMENTATION FRAMEWORK

Success in promoting and implementing the RONAdapt, and in developing climate-resilient and disaster risk reduction strategies more generally, will depend on:

- Line ministries, utilities and community organisations implementing the priorities described in Section 4, as well as mainstreaming CCA and DRR into sectoral, organizational and community policies and practices.
- Coordination and oversight of priority CCA and DRR activities. This includes monitoring implementation, reporting across government on progress, and also supporting information and knowledge management. Information needs to be shared across government and with communities, to support coordination and build capacity over the longer term.
- Technical guidance provided by CIE’s technical working groups.
- High-level guidance within government provided by the CIE Project Steering Committee (PSC), enabling coordination and providing direction on emerging priorities.
- Engaged political oversight through engagement of Cabinet and the President, helping to steer resources and activities and to connect with the international negotiations on climate change.
- A framework for learning about successes and failures, consisting of monitoring and evaluation (M&E), coordinated by CIE. In addition to monitoring progress in implementation, it is desirable to also evaluate the effectiveness of activities in improving (or not) resilience and reducing vulnerability and risk. Even with good intentions, not all actions succeed in delivering long-lasting positive change, so an evaluation framework enables Nauru to learn from experiences, and ensure future activities build on the lessons of earlier actions.
- Sound public financial management, to ensure resources are available for timely implementation and transparent reporting, and a financing strategy that includes a proactive approach to the engagement of development partners.

These are described in more detail below. The institutional structure to support implementation of the RONAdapt is illustrated in Figure 6. This sits alongside and links directly to the existing NSDS and national budgetary framework and uses existing structures where possible.

5.1 Implementation of CCA and DRR activities

Responsibility for implementing CCA- and DRR-related activities is shared across different parts of government and the community. Some of the important implementing entities are visible in Figure 6, though there are others not specifically included in the figure.

Community involvement is also critically important. In Nauru, interrelations between all levels of society are very strong. Nauru has 15 district council and community based organizations (CBOs) represented by district community leaders, such as the National Youth Council, 350.org and the Nauru Island Association for non-government organisations (NGO’s). There are many activities within which the community organizations and civil society groups will have a key active role to play. In these cases, appropriate information, training, communication mechanisms and human and financial resources should be provided in order to enable them to engage fully and provide their experience and expertise to contribute into the implementation of the RONADAPT.

The priority activities highlighted in the RONAdapt require, in most cases, further development through some additional steps before they are ready to be implemented. They need to be translated into specific actions on the ground, and they need to be costed so that funding can be sourced. Going forward, it is anticipated that the responsible agencies will further detail the specific actions (if they have not already in the relevant sectoral plans), through the revision of sectoral plans and/or through the design stage of individual projects.

5.2 Coordination and policy support

At the operational level, the Department of Environment under the Ministry of Commerce, Industry and Environment (CIE) has primary responsibility for coordination of Nauru's climate change activities. CIE includes a Climate Change Unit as well as a National Disaster Risk Management (NDRM) Unit⁶.

Through these units, CIE provides operational oversight of implementation, and support the integration of RONAdapt actions into strategies and programmes of relevant ministries (including providing climate- and disaster-related inputs to the development of national and sector policies and plans). The roles of the CIE climate change unit and disaster management office include the following (in relation to CCA and DRM respectively):

- Planning and policy advice and development;
- Coordinating knowledge about CCA and DRR activities within the RONAdapt framework, so that they can report to higher level coordination bodies and the Cabinet on progress and challenges, as needed;
- Implementing CCA or DRR projects, in some cases where they fall within the mandate of CIE (for example, some water actions, agriculture, disaster management);
- Compiling information about ongoing CCA and DRR activities in Nauru, and sharing information across government and with the community, using robust Information and knowledge management processes;
- Monitoring and reporting on the RONAdapt implementation including activities implemented by other sectors/departments/actors;
- Updating of the RONAdapt at least every 5 years, in consultation with the TWG, the PSC and other stakeholders both within and beyond government;
- Providing Secretariat support to the Technical Working Group; and
- Reporting to the Project Steering Committee and seeking their strategic advice, as necessary.

A key role of CIE is reporting to the PSC, Cabinet and the Planning and Aid Division (PAD) of the Department of Finance and Sustainable Development on progress of implementing the RONAdapt priorities. This, in turn, relies on line ministries providing regular updates to CIE on progress. The presence of some departments on the CIE Technical Working Group facilitates this regular reporting and exchange to some degree, but in addition it is necessary for CIE to regularly consult with other parts of government to ensure their voice in setting CCA and DRR priorities, in contributing ideas relating to the use of funds that become available, and to keep updated of their activities.

Both the Climate Change Unit and DRM Unit report directly to the Secretary for CIE.

5.3 Technical advice

CIE convenes technical working groups (TWG) to play a technical advisory role, as needed. TWGs are comprised of technical officers from different government departments; for instance, for water issues the TWG includes the CIE Water Unit, CIE Climate Change Unit, CIE Disaster Risk Management Unit, Nauru Utilities Corporation, Nauru Rehabilitation Corporation, Planning and Aid Division, Bureau of Statistics, and Ministry of Health (Public Health).

During the implementation of RONAdapt, the role of the TWG will be to provide timely and regular technical advice and recommendations to the Climate Change Unit and, where requested, the NDRM Office, as well as to the Project Steering Committee (see below). The TWG also serves as a platform for coordination, particularly for information exchange between different departments and utilities.

5.4 High level guidance and oversight

Leadership, guidance and high-level coordination of RONAdapt implementation is centred on the CIE Project Steering Committee (PSC) and, for DRM issues specifically, the NDRM Council.

The PSC was established to improve consultations between different agencies on development issues, as well as operational oversight of the implementation of policies and programmes related to environment, water, sanitation, energy, waste, management and climate change. The PSC is expected to consider proposals and implementation matters related to the RONAdapt.

The PSC is chaired by the Secretary CIE and consists of Secretary and Director level representatives, as well as representation from the community and the private sector. As a multi-stakeholder committee, this provides the cross-sectoral inter-governmental oversight and direction that is needed to successfully implement the RONAdapt. Representatives from both the private sector and the community sit on the PSC, and in addition the Committee should also consult from time to time with wider representatives of the private sector through the Nauru Business Private Sector Organisation and with community-based organisations.

The National Disaster Risk Management Council (NDRMC) is the primary policy-making body within the Government for DRM issues. It is supported by the NDRMO in CIE and reports directly to the Cabinet. The NDRMC will continue to provide high-level guidance, advice and endorsement on DRM issues as needed.

The Government plans to establish a High Level Climate Change Steering Committee (HLCCSC), consisting of the secretaries of CIE, Foreign Affairs, the United Nations Mission in New York and the Cabinet. The purpose of this Committee would be to provide information and advice to the President on climate change and disasters related issues. Steering committee members will facilitate senior-level support and influence in terms of ensuring that the RONAdapt actions are integrated into the work plans and budgets of relevant ministries and agencies and will inform PSC with updates of regional and international frameworks.

5.5 Political oversight

In 2012 a Ministry for Climate Change, Police and Emergency Services was created under the oversight of the President. The Secretary to Cabinet provides support to the President in his role as Minister of Climate Change and Disasters, acting as a conduit for advice from relevant line agencies.

5.6 Financing strategy and engagement of development partners

Resources and skills are needed to implement the priority actions outlined in the RONAdapt, and to identify, plan and implement future activities to continue building the resilience of Nauru to climate change and potential disasters. While currently heavily dependent on external partners for support, there is a need to plan for a time when Nauru's communities and government can sustain itself – financially, technically and socially. To this end, it is necessary to:

- Make efficient and effective use of available resources, to ensure that these target priorities and that activities are well implemented;
- Increase access to additional funds that can help support CCA and DRR in country, including dedicated climate funds where feasible;
- Ensure activities supported by external development partners align with Nauru's priorities. The RONAdapt already contributes to this by identifying areas in which Nauru seeks support;
- Implement those activities that can already be addressed by respective government departments and ministries without major new resources, particularly institutional strengthening actions that target finalisation of draft policies and plans;
- Encourage innovative ways of building human capacity in Nauru; and
- Strengthen public financial management processes to build the confidence of development partners in channeling funding through government systems.

Although revenue to address it's the many challenges is limited and the support of development partners will be critical, some of the actions described in the RONAdapt can be undertaken and finalised within available resources. Many of the institutional strengthening activities relate to updating and/or finalising sectoral development plans are already a core function of individual ministries and departments, and should be progressed.

⁶ Disaster risk management activities are coordinated at the program level through the National Disaster Risk Management Office (NDRMO). In 2013, NDRM was transferred to CIE under the Environment Division where it is managed by a Deputy Controller. The Police Commissioner acts as the National Controller in the event of a disaster.

Implementation of many of the priorities in RONAdapt will be heavily dependent on resources being made available by external development partners, to supplement limited domestic funds. While dedicated climate funds proliferate at the international level, these can be challenging to access for a small country like Nauru, given the high transaction costs involved. Therefore, Nauru intends to place considerable emphasis on working with its bilateral partners and regional agencies, for the financial and technical resources needed to implement the RONAdapt priorities. As indicated earlier, detailed cost estimates have not been prepared as part of the RONAdapt, but are expected to be prepared as the government and development partners begin to design and implement the various priority actions.

The Department of Finance and Sustainable Development (DFSD) assists the Government across a wide range of policy areas in regard to expenditure and financial management. It includes the Planning, Aid and Development Unit, responsible for a significant portion of climate change and disaster risk management related projects. All external resources channeled to Nauru are expected to come through the DFSD, and implementing ministries need to work with Finance to access resources and provide Finance with timely, up-to-date reporting on expenditure.

Building human capacity through development cooperation

Human capacity is a critical weakness in Nauru, especially in key service sectors such as education, health and governance.

A key ambition is that future activities involving development partners make a conscious effort to build local human capacity. In practice, this means activities funded and/or implemented with support of external partners should aim to maximise opportunities for skills transfer to local staff and/or communities. One strategy for addressing this is to require future externally funded development projects (including those focused on CCA or DRR) to emphasise skills transfer components. Up-skilling of local staff should be a core priority of all project activities, since it will help position Nauru better to be able to respond to an array of future challenges, including planning for and responding to climate change and disasters.

5.7 Monitoring and evaluation

Monitoring and evaluation (M&E) are critical tasks, not only for tracking progress on the implementation of CCA and DRR priorities but also to ensure stakeholders in Nauru (and their development partners) learn from activities in order to improve the design and delivery of future interventions.

Monitoring consists of (i) collating information on activities (tracking), and (ii) sharing information across government and with the community (reporting). Evaluation consists of analysing what is achieved at the community and national levels – what changes have been brought about, how sustainable they are, how have these reduced Nauru's vulnerability and/or increased capacity to adapt to future events and conditions?

The M&E framework for RONAdapt reflects the desire for tracking and learning, and also recognises the limited institutional, human and financial resources available in Nauru to dedicate to M&E. A simple M&E framework has been adopted. Rather than collecting data on a set of detailed indicators for each of the many individual priority actions described by the RONAdapt, the M&E framework consists instead of a less-resource intensive approach. Ideally, many of the activities and outcomes will be tracked through M&E of the NSDS and of sectoral strategies. Key responsibilities are as follows:

- CIE is responsible for collating information and data on progress and implementing RONAdapt priorities. This means compiling information from different agencies, utilities and the community, as needed.
- PAD, who have oversight of implementation of the NSDS, will be a key source of information for CIE. For M&E of the NSDS, PAD will already be collecting some of the information needed to assess progress with many of the activities listed in RONAdapt.
- Those line agencies and utilities listed as leads for individual activities in Annex 2 will report regularly to CIE on progress with priority activities in the RONAdapt. Much of this reporting should be facilitated through the TWG and the PSC, since both have cross-government participation.

These arrangements are reflected in Figure 6. CIE will be responsible for regularly updating the Cabinet, the PSC, the NDRMC and the High Level Steering Committee as needed. CIE will also be responsible for initiating and overseeing future updates to the RONAdapt document as needed.

Tracking of implementation

1. CIE is responsible for tracking overall progress of Nauru in implementing the RONAdapt. As part of this, CIE will convene an annual meeting involving all implementing entities, as well as other key stakeholders, to compile reports from different departments and organisations and to make an overall assessment of progress. CIE will prepare a brief annual report for the government, to be copied to PAD (for tracking NSDS).
2. Line agencies and SOEs are to provide annual status updates on each of the priority actions for which they are responsible. Reporting will be to CIE through the annual meetings above.

Many of the priority actions in RONAdapt are also core priorities in sectoral policies and plans, and in these cases there is usually a component of M&E which can complement reporting on RONAdapt. Some of the relevant sectoral plans have already identified monitoring indicators, which can also serve the function of monitoring progress of RONAdapt implementation.

Evaluating impact

Detailed impact evaluation from individual priority actions is resource intensive and at this point in time is beyond Nauru's capacity to implement effectively. Instead, evaluation will consist of a number of survey exercises "before and after", designed so that the government is able to qualitatively, if not quantitatively, assess general trends or changes in the country over time.

Specifically, it is proposed that these surveys include:

- Assessments of institutional capacity; and
- Community-based vulnerability surveys.

Nauru proposes to develop, with support from its regional partners, suitable evaluation approaches that can be used to assess whether CCA and DRR efforts, and the RONAdapt specifically, are being effective in improving resilience to climate change and potential disaster events. Responsibility for advancing and implementing evaluation rests with the Planning and Aid Division, with support from CIE.

ANNEX 1

PREPARATION OF THE RONADAPT AND STAKEHOLDER INVOLVEMENT

The preparation of the RONAdapt has taken several years, with various phases of input from government and community stakeholders in Nauru with support from SPC, GIZ and other regional organisations including SPREP.

The idea of developing a climate adaptation action plan was first raised in 2010, when the intention was to prepare a document similar in form and substance to the National Adaptation Programmes of Action (NAPAs) being prepared by least developed countries under the United Nations Framework Convention on Climate Change (UNFCCC). Initial workshops in Nauru in 2010, mapped out key vulnerabilities and priority actions based on examining climate risks in relation to various key sectors of the economy. The objectives for such an action plan in Nauru were to determine immediate priority actions and improve access to international climate finance to address them.

In 2012, a further workshop supported by SPC, GIZ and SPREP was convened in parallel with meetings to review national progress towards commitments under the Hyogo Framework for Action (HFA). At this point, it was decided to bring climate change adaptation (CCA) and disaster risk reduction (DRR) together into a single framework, in other words to shift from a NAPA-style document to an output of similar intent to the Joint National Action Plans (JNAPs) being developed in some other Pacific countries. Participants at a national workshop identified the following objectives for RONAdapt: Support mainstreaming of climate and disaster risks into national and sectoral policies and plans, strengthen coordination and information and knowledge management of climate change initiatives, identify key immediate priorities for action, facilitate access to finance to address these issues. Also in 2012, SPC/GIZ convened a number of sector workshops to review work done in 2012 and identify further key climate risks and priorities, focusing on agriculture, fisheries, infrastructure and education.

Through each of these processes, various goals and priority actions began to emerge for inclusion in the RONAdapt. In parallel, some sectors such as water and energy were developing detailed policies and implementation plans, and these have since been finalized. These sectoral plans have therefore also been an important source of priorities that are emphasised in the RONAdapt.

Technical inputs to the 2012 draft were sought from various experts including various SPC, SPREP divisions and the World Health Organisation and coordinated by GIZ.

In 2013, the Department of Commerce, Industry and Environment (CIE) requested support from SPC to finalise the RONAdapt, through the European-Union funded Global Climate Change Alliance: Pacific Small Island States (GCCA: PSIS) project. Further support was also provided through the SPC/GIZ Coping with Climate Change in the Pacific Island Region (CCCPIR) project. Several rounds of consultation and workshops in Nauru have occurred since then, the first in December 2013 and further meetings in April 2014.

In summary, the document has evolved over time as priorities have been fleshed out, updated and as lessons have been learned from the development of other JNAPs across the region. As stressed in the document itself, Nauru's CCA and DRR priorities will continue to change over time, as more information becomes available and as capacities within government and the community to engage with CCA and DRR increases.

It is not possible to list all the individuals who have contributed to the preparation of the RONAdapt. Listed below are those who have been involved in Nauru consultations in 2013 and 2014.

December 2013

- Bryan Star, Director, Department of Commerce, Industry and Environment (CIE)
- Roy Harris, Deputy Controller, National Disaster Risk Management Office, CIE

- Stephanie Ziersch, Environmental Officer, CIE
- Michael Aroi, Secretary for Foreign Affairs, Department for Foreign Affairs and Trade
- Dr. Seta, Secretary of Health, Ministry of Health
- Vincent Scotty, Health Inspector, Ministry of Health
- Ann-Steshia Hubert, Ministry of Health and community leader
- Haselden Buraman, Water Unit, CIE
- Mavis Depaune, PACC project coordinator, CIE
- Helga-Bara Bragadottir, Country Development Manager, UN Joint Presence Office
- John Limen, Deputy Secretary Finance Planning, Department of Finance, Planning and Aid Division (PAD), DFSD
- Samuel Grundler, Director of Aid Management, PAD
- Darlyn Harris, Acting CEO, Nauru Fisheries & Marine Resource Authority
- Mason Dick, Director of Agriculture, CIE
- Leila Miniac, Agriculture, CIE
- Jimna Myukino, Agriculture project, CIE
- James Gearing, Chief Executive Officer, RONPhos
- Sean Halstead, Manager and Acting CEO, Eigigu Civil Works
- Annette Cook, Secretary of Women Affairs
- Manfred Depaune, formerly President of Nauru Island Association of Non-Government Organisations (NIANGO)
- Nodel Neneiya, former climate change officer, CIE
- Tekohi Rivera, CEO, Nauru Rehabilitation Corporation (NRC)
- Julie Olsson, NIANGO Coordinator
- Maria Gaiyabu, Secretary, Department of Education
- Being Yeeting, Fisheries Advisor, NFMRA

April 2014

- Bryan Starr, Director Environment, CIE
- Reagan Moses, Climate Change Officer, CIE
- Haseldon Buraman, Water Unit, CIE
- Elna Aliklik, Biodiversity Project Officer, CIE
- Salodina Thoma, Director Agriculture division, CIE
- Roy Harris, National Disaster Management Officer, CIE
- Cathy Denitage, Policy Officer, CIE
- Ann Hubert, Department of Health, 350.org coordinator, President National Youth Council, Anabar community leader
- Vincent Scotty, Environmental Health Unit, Department of Health
- Tepua Suaesi, consultant working with CIE on NBSAP
- Tekohi Rivera, CEO Nauru Rehabilitation Corporation (NRC)
- Haseldon Buraman, Water Unit, CIE
- Calistus Kain, Business and Commerce, CIE
- Samuel Grundler, Planning and Aid Division (PAD)
- CIE Water Technical Working Group (attendees included representatives of climate change, environment, biodiversity (consultant), DRM, water, agriculture, waste and infrastructure and planning and development).
- Elkoga Gadabu, Secretary CIE
- Claudette Wharton, national coordinator, GCCA:PSIS project, CIE

ANNEX 2 SUMMARY OF SECTORAL PRIORITIES

A2.1 Water resources

Water resources in Nauru are a precious commodity, and water scarcity a major challenge. Communities rely on a combination of expensive treated seawater from reverse osmosis desalination plants (which is delivered to households by truck since there is no water reticulation system), rainwater and in some areas groundwater. Rainwater collection and use is limited by frequent droughts and insufficient rainwater capture and storage facilities, while much of the available groundwater has been contaminated either as a side effect of phosphate mining or by leakage of sewage from septic systems, making it unsuitable for human consumption and even in some cases for agricultural use. Water quality from both sources has proved difficult to maintain, and water-borne illnesses including diarrhea and skin and eye diseases are commonly observed. Treated seawater is expensive to produce and supply is also constrained by the limited national storage capacity. Further, the desalination plants are energy-intensive which means that high demand for treated water presents a financial burden on the government and increases Nauru's vulnerability to international oil prices.

Climate change and disasters will exacerbate these existing challenges of meeting demand for potable water, posing threats to basic livelihoods and constraining opportunities for economic development. Projections indicate Nauru may receive more rainfall in future, but within shorter periods of intense rain. With present infrastructure, this could result in less overall rainwater harvesting due to storage capacity constraints at the household and community level. Sea level rise and storm surges are likely to further inundate coastal groundwater, making it less suitable for human use. Disaster events such as storm surges could, for example, threaten key water infrastructure which tends to be located in the low-lying coastal zone (e.g. desalination plant, storage tanks, roads for household water deliveries), while the need to extinguish fires during dry periods means precious water resources are diverted away from households and businesses.

From a disaster perspective, the key water concern in Nauru is drought, and loss of secure water for key services such as the hospital. During periods where there is little or no rain for more than 3 months, Nauru's water supply situation deteriorates dramatically, and production capacity becomes stressed. If the RO units break down during drought periods, Nauru faces a social and health disaster. Enhancing water security is therefore both a key national development priority and also fundamental to reducing vulnerability to climate change and to potential disaster events.

The Nauru Water, Sanitation and Hygiene Policy (NWSHP) 2012 aims to establish "reliable, safe, affordable, secure, efficient and sustainable water supply", accounting for current and future risks to water resources. Successful implementation of the priority goals and strategies described in the associated Nauru Water, Sanitation and Hygiene Implementation Plan (NWSHIP) 2012 will significantly boost Nauru's resilience to climate change.

Table A2.1 details the goal and targeted outcomes of priority activities for the water sector with respect to climate change adaptation and disaster risk reduction. These activities are guided by the NWSHIP, which indicates that highest priority actions should include increasing RO production capacity as well as improving the state of household water and sanitation infrastructure.

Table A2.1 CCA and DRR priorities the water sector

Strategy	Activities	Lead
Fill information gaps and increase access to baseline information about the water sector	<p>Conduct a National Water Audit, including assessment and mapping of current resources (including groundwater) and their sustainable yield, quality and fit-for-purpose uses.</p> <p>Set up a coordinated water resources and sanitation monitoring and reporting system, linked to a centralised, publicly accessible national water resources, sanitation and hygiene data base.</p> <p>Establish a system for regular and ongoing data collection, to update and report on water demand by different sectors from all sources. This includes collecting, storing and analysing data on rainfall and rainwater harvesting.</p>	CIE
Increase water supply and storage capacity	<p>Prepare a 20-year infrastructure investment, maintenance and replacement program (Water and Sanitation Master Plan), including consideration of water treatment needs. This will identify key needs, however some known priorities (i.e. "no regrets" actions) are as follows.</p> <p>Increase production capacity of the reverse osmosis units, which is critical during droughts.</p> <p>Increase capacity for public rainwater collection and storage, through targeted investments in new public rainwater infrastructure, at community and national level (for example, use of airstrip as water catchment, rainwater collection infrastructure on Topside). Increased rainwater harvesting will reduce the financial and environmental (energy-related emissions) costs associated with desalination plants.</p> <p>Develop and implement a program to reduce unaccounted-for water and water losses from desalination system</p> <p>Augment national water storage capacity, in order to be used for storage of treated water from desalination plants.</p>	CIE, NUC
Reduce water demand	<p>Introduce incentive programs and technologies for water use efficiency at the household and business level (e.g. retrofit households with water efficient devices)</p> <p>Amend water pricing regime to increase cost recovery for water supply</p> <p>Develop a public education, communication and behaviour change strategy around water use issues, to increase capacity, raise awareness and encourage participation in conserving and protecting water sources. This includes, for example, establishment of local district water, hygiene and sanitation sub-committees.</p>	CIE, NUC
Rehabilitate and protect groundwater resources	<p>Introduce incentive programs for moving to improved sanitation systems that minimise groundwater pollution and reduce the use of potable water for flushing</p>	CIE, MoH
Disaster and contingency management for water sector	<p>Develop early warning system for extreme seasonal weather and climate events relevant to water supply, such as changes in the ENSO system. These will enable communities to take action to, for instance, store water ahead of projected dry periods, or clean rainwater systems ahead of project wet periods.</p>	NUC, NDRMO

The Department of CIE is responsible for coordinating implementation of these priority actions as resources become available, though individual components require leadership from other parts of government and from other stakeholders, including NUC who are responsible for water production and delivery.

Institutional strengthening and mainstreaming

In the water sector, there are also some important policy and planning gaps that need to be filled, specifically:

- Development of a 20-year Water and Sanitation Master Plan to guide planning, including investment in and maintenance of infrastructure, and which specifically integrates climate variability, climate change and disaster risk considerations.
- Finalisation and endorsement of the Drought Management Strategy. The strategy should link to the NWSHP and the DRM Plan.

A2.2 Health

Major health issues in Nauru include non-communicable diseases (NCDs) and water-borne illnesses.

Nauru has very high rates of NCDs including cardiovascular disease, diabetes, cancer and respiratory diseases. According to the Nauru NCD Risk Factors Report⁷, Nauru has the poorest health indicators for NCDs in the Pacific region, and these are the most important drivers of morbidity and mortality in Nauru⁸. The majority of hospital admissions in Nauru are due to diabetes and associated complications, while life expectancy is among the lowest in the Pacific region and has declined over the last two decades. The prevalence of NCDs is linked to obesity, smoking, low levels of physical activity and poor nutrition. NCDs are a significant burden on communities and the government, and by making people more vulnerable to heat and water stress, for instance, they also make people more vulnerable to future climate change. Therefore, tackling the underlying drivers of NCDs is a priority. A NCD Action Plan was drafted in 2004.

Water-borne illnesses are also a major issue, especially following flooding during heavy rains. In the health sector, priority actions to tackle this include improved community education and behavior change campaigns to reduce exposure pathways. Priority actions in other sectors can also contribute to reducing water borne-illness, for instance the provision of better drainage infrastructure to reduce the occurrence of flooding around settlements, and improved sanitation systems to reduce contamination of water.

There is currently no functioning Health Information System. Previous patient records have been damaged in a series of accidents, while the health indicator monitoring conducted by District Primary Health Care workers (i.e. health profiles for communities) should be updated centrally but there is currently no system for this. This means Nauru has limited capacity for developing and maintaining a disease surveillance system to provide early warning and timely interpreted data to support response planning to epidemics and pandemics such as influenza.

Nauru's small population and distance from other countries also presents challenges in providing quality, cost effective health care. Supply lines are not always reliable, key services such as water and energy are at times disrupted, and health infrastructure (including both hospitals) are subject to coastal flooding risks. Lack of local capacity is an additional constraint to improved health outcomes. In the absence of formal health worker training on Nauru, the provision of health and medical services is highly dependent on expatriate staff.

Climate change and extreme events are anticipated to introduce additional stresses, both to community health as well as to the functioning of the health care system.

- According to the World Health Organisation (WHO, 2009), globally climate change and natural disasters increase the threats of: communicable and non-communicable diseases, including vector-borne, water-borne and food-borne diseases; injuries and deaths from extreme weather events; compromised food security and malnutrition; and mental health impacts of, among other things, loss of livelihoods and climate change-induced population displacement.

- As part of developing the draft Nauru Climate Change and Health Action Plan (NCCHAP, 2012), an assessment was conducted of climate-sensitive health risks in Nauru, including consideration of the baseline burden of climate-sensitive diseases. The main climate change impacts on health were assessed as being mainly through drought and associated diarrheal diseases and worsening food security conditions leading to poorer nutrition and exacerbating existing challenges in combating NCDs. In addition, climate change and disasters also present risks to health infrastructure.
- From a disaster perspective, the greatest risk to the health sector are (i) possible relocation needs during extreme events such as fire, tsunami or major flooding (in particular, the ability of hospitals continue to deliver daily treatments, such as to dialysis patients, if physical relocation of patients is required) and (ii) supply chain disruptions are a threat to medical treatment (medicines, energy, water).

Table A2.2 details priority activities for the health sector related to climate change adaptation and disaster risk reduction.

Table A2.2. Priority CCA and DRR activities for the health sector

Strategy	Activity	Lead
Fill key knowledge and awareness gaps to reduce community health risks, including those relating to the impacts of climate change	Undertake an epidemiological study of the expected changes in climate-sensitive diseases in Nauru (e.g. dengue fever, diarrhoeal disease)	MoH
	Strengthen health-related information systems (data collection, collation, analysis) and improving staff capacity in the areas of biostatistics and epidemiology	
	Progress community education, health promotion and awareness-raising , integrating climate and disasters-related health issues.	
Reduce chronic health problems of the community	Implement NCD Action Plan	MoH
Expand environmental monitoring capacity	Establish a vector-borne disease control unit under the Environmental Health unit. Introduce monitoring and surveillance of climate- and disaster-related health risks, including of key illness/disease vectors: <ul style="list-style-type: none"> • Water quality – at households, and in Buada lagoon, which is a resource for aquaculture • Mosquitoes – indicates potential for major outbreaks of diseases such as dengue • Food – contamination as a result of polluted water, introduction of illegal foods to Nauru through quarantine • Ocean temperatures and incidence of marine toxins, to warn of possible outbreaks of ciguatera in reef fish • Mycotoxins and pathogens in aquaculture/fisheries, in areas at risk of contamination during extreme rainfall events or as a result of leachate from waste disposal • <i>Animals – disease testing as needed</i> (e.g. migratory birds are a vector for the introduction of new diseases) 	MoH, CIE DoA, Fisheries
Build human capacity of health services	Train health officials in identifying symptoms and early treatment options for water-borne diseases	MoH, CIE

⁷ Nauru NCD Risk Factors STEPS report, Republic of Nauru and the World Health Organisation, 2007. http://www.who.int/chp/steps/Printed_STEPS_Report_Nauru.pdf

⁸ The National Health Strategic Plan (2010-2015) cites NCD's as the cause of 79% of deaths on the island [MoH, 2010].

Secure key health infrastructure and services against extreme events	Develop/update (if needed) emergency management plan that addresses critical health sector needs (e.g. water for dialysis patients during extreme events, critical patient relocation) Conduct training programmes and information campaigns on emergency management for health sector staff	MoH, NRC, MoE, NDRMO
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The Ministry of Health is responsible for overseeing implementation of these priority actions as resources become available, though individual components require direction from other stakeholders.

Institutional strengthening and mainstreaming

In addition to the above, there is the need to build local capacity of the health sector to prepare and cope with adverse effects of climate change and vulnerability of disasters. There are also some important policy and planning gaps that need to be filled, specifically:

- Endorsement of the 2009 Public Health Bill, which is currently still in draft form;
- Finalisation and endorsement of the NCCHAP;
- Incorporation of climate change and disaster related considerations into the upcoming revision of the National Health Strategic Plan;
- Finalisation and endorsement of the Food Safety Regulations, to give regulatory backing to the Food Safety Act; and
- Updating and endorsement of a revised Environment Act.

A2.3 Agriculture

Food insecurity is a major risk for Nauru, given the island's dependence on imported foods and its geographic isolation. This situation is also closely linked with health problems such as the prevalence of NCDs, and is exacerbated by government debt and household income levels which make imported foods expensive and supply unsteady. For these reasons, agricultural development is targeted by the NSDS as a priority.

Agricultural production is relatively small at present, and is constrained by limited availability of suitable land and water, and by limited expertise and interest in growing food and raising livestock. The island's soil is relatively infertile and has poor water holding capacity while in some areas is also contaminated. In addition, the land tenure system means land ownership is fragmented and little is publicly owned, which increases the complexity of land management. What little fertile land remains untouched by mining is in the coastal strip, and thus in small parcels around houses.

Most agricultural activity in Nauru is carried out by individual households on family land. According to the most recent census, 13% of households (more than 250 in total) grow food of some kind, though diversity and volumes are low. The most common food grown is paw paw (10% of households), followed by bread fruit (6%) and pumpkin and cabbage. There is no commercial agriculture. In recent years the government has initiated a "grow and green" programme to encourage households to participate in agriculture, through planting of fruit trees and vegetables including breadfruit, lime, coconut, pawpaw, sourpaw and mango. Also, the ROC-Taiwan Technical Mission (TTM) has been supporting the development of kitchen gardens; water distribution during drought; livestock; egg production; and training in best practices (i.e. mulching, cover cropping, composting, waste management, transplanting) to facilitate growth of crops such as cucumber, cabbage, watermelon, pumpkin and cherry tomato. The TTM has developed two small farms – for horticulture and livestock, respectively – to demonstrate farming techniques and trialing of vegetable cultivars. The two farms are expected to be handed over to the government in the future.

Climate change adds to the already significant challenge of attaining the NSDS goal of increasing domestic agricultural production. Climate variability driven by the ENSO also makes stable agricultural production a challenge; the prolonged droughts that are a feature of La Niña conditions

can limit the type of crops that can be grown, while extreme rainfall events during El Niño periods can lead to crop losses through water logging and soil erosion.

Despite these constraints, there is potential to increase agriculture production and productivity, and in doing so strengthen food security and improve livelihoods and health, thus contributing to Nauru's efforts to reduce vulnerability to future climate change. The NSDS emphasises four strategic actions namely: developing local food and agricultural production initiatives such as kitchen gardens, fruit tree planting and root cropping; promoting production of value-added forestry and agro-forestry products for domestic consumption; promoting viable piggeries and duck and poultry production (including for eggs) and agricultural businesses; and setting up a resource centre on agricultural and livestock production.

The Strategic Plan for the Sustainable Development of Agriculture in Nauru (2007-2017) (SPSDAg) developed with assistance of FAO, is the first step in the government's efforts to strengthen agriculture development and promote greater self-sufficiency and food security. The policy goals and strategies of the SPSDAg include the ambition of significantly increasing the quantity of locally grown agricultural produce, as a means to improve food security and simultaneously improve community nutrition. To accomplish this, it highlights the need to expand dedicated water storage facilities and promote water-efficient irrigation techniques, to cultivate partnerships between growers, government and donors, to build local capacity, and to strengthen policy and regulatory frameworks for the agriculture sector, as well as governance frameworks.

Improving water security specifically for agricultural production is a key need, particularly since previous initiatives such as Grow and Green have stalled because of inadequate water. Water security for agriculture is also an important strategy from a disaster risk reduction perspective, since a healthy agricultural sector reduces the risk of food insecurity and shortages.

Table A2.3 details priority CCA and DRR activities for the agriculture sector. Overall, food security is a major concern in Nauru, while agricultural production is small and not well established. Our priorities, therefore, focus on encouraging greater smallholder participation in crop and livestock production (rather than commercial scale), and boosting skills in these areas.

Table A2.3 Priority CCA and DRR actions for the agriculture sector

Strategy	Activity	Lead
Improve water security for agricultural needs	Invest in dedicated water storage to ensure supplies available during drought periods (water for agriculture is otherwise a low priority during water shortages) Introduce more efficient water use practices, including simple irrigation systems such as "bucket irrigation" and the use of recycled and grey water for irrigation of kitchen gardens Introduce and promote drought tolerant crop varieties. Encourage use of shade for crops where appropriate, to reduce evaporation and hence water stress	CIE, NUC
Increase household engagement with agriculture and livestock	Support community and household education and training in kitchen gardening (including through the school curriculum) Encourage house-hold production of livestock (pigs and chickens) for meat and eggs and improved livestock husbandry practices to cope with the effects of drought Encourage greater consumption of local produce , through community awareness and behaviour change campaigns.	CIE

Table A2.3 Priority CCA and DRR actions for the agriculture sector (continued)

<p>Improve grower skills and practices, to increase productivity and make crops less vulnerable to extreme events such as drought</p>	<p>Engage growers in the documenting of best practice examples. Include guidance on the use of composting and mulching to improve soil fertility and moisture retention, incorporate knowledge from traditional practices, and management options for responding to extreme events such as droughts or heavy rainfall periods.</p> <p>Encourage further development of nurseries to propagate planting material and improve growing stock by nurturing and distributing appropriate crop varieties (e.g drought tolerant plant varieties).</p> <p>Improve seasonal forecasting and grower access to weather and climate information to enable growers to adapt the type or variety of crop planted.</p>	<p>CIE</p>
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The Division of Agriculture under department of CIE has primary responsibility for supporting agricultural development from subsistence to small scale farming, and is the lead agency responsible for overseeing implementation of the agriculture sector’s priority CCA and DRR actions. Institutional strengthening and mainstreaming

The institutional and human capacity available in Nauru to support and expand agricultural development is limited and needs to be expanded:

- Human capacity within both government and the community requires dedicated skills training programs in agricultural production and management. Skills development is a near-term priority, since implementation of other activities depends on this.
- The Strategic Plan for the Sustainable Development of Agriculture in Nauru (2007-2017) should be reviewed and updated.
- Food Safety regulations need endorsement (as mentioned in the Health section), to protect agriculture in Nauru from pests. Fruit fly incursions have previously destroyed crops, and improved inspection and quarantine practices will help protect Nauru from further incursions⁹.
- Development of a Waste Management Policy for agriculture, particularly for livestock waste which needs addressing if greater production is to be encouraged.

A2.4 Fisheries and marine resources

Fisheries are a critically important resource in Nauru, contributing to food security and cultural practices (particularly in low income households) as well as providing an important source of foreign revenue for government.

Foreign fleets licensed to fish in Nauru’s exclusive economic zone (EEZ) made average annual catches of 63,000 tonnes between 1999 and 2008, worth USD 52 million. Revenue from the sale of fishing licenses are an important contributor to the annual government budget. By contrast, Nauru has only a very small local fishery for tuna within its EEZ. Greater capitalisation of the economic benefits from fishing beyond the territorial sea should be pursued, since at present Nauru receives only a fraction of the value of this resource¹⁰.

Coastal fisheries are made up mainly of three categories: demersal fish (bottom-dwelling fish associated with coral reef habitats), near-shore pelagic fish (including tuna, rainbow runner, wahoo and mahi-mahi), and invertebrates gleaned from intertidal and sub-tidal areas. Demersal and near-shore pelagic fish are estimated to make equally important contributions to total catch.

Climate change will affect fisheries. Nauru lies within the Pacific Equatorial Divergence (PEQD) and the Western Pacific Warm Pool (Warm Pool) provinces, depending on the prevailing El Niño-Southern Oscillation (ENSO) conditions. The PEQD province is generated by the effects of the earth’s rotation on the South Equatorial Current, which results in significant upwelling of nutrients, conditions which

⁹ Situation Analysis and Agriculture Sector Overview. Report by the Food and Agriculture Organisation (FAO). http://www.fao.org/fileadmin/user_upload/sap/docs/Nauru.pdf

¹⁰ Nauru National Assessment Report for the Third International Conference on Small Island Developing States (SIDS). May 2013.

create the richest surface waters in the region. Climate change is projected to increase sea surface temperatures, sea levels, ocean acidification and to change ocean currents. These effects will, in turn, impact on Nauru’s fisheries resources¹¹:

- The ability of corals and invertebrates to form will be affected by ocean acidification (the result of absorption of carbon dioxide from the atmosphere), which reduces the availability of calcium carbonate;
- Coral bleaching will increase as a result of higher sea-surface temperatures; and
- The abundance of key oceanic fish species will be affected by changes to ocean currents, such as the Southern Equatorial Current, and to the area and location of the PEQD and the Warm Pool and their convergence (which results from changes in the El Niño-Southern Oscillation)¹².

Given Nauru’s small size, geographic isolation and limited air connections, the emergence of a viable, locally-based export fishing industry is unlikely¹³. However, fisheries and marine resources underpin livelihoods in Nauru, particularly during times when other food supplies are unreliable. Furthermore, improving the status of fisheries and marine resources will contribute to a number of the development goals in the NSDS including improving governance, enhancing food security and maximizing revenue. Given the vulnerability created by food insecurity and high government debt levels, fisheries management is an important focus for building longer term resilience in Nauru.

Fisheries management in Nauru is guided by the Fisheries NSDS and the Nauru Fisheries and Marine Resources Authority Corporate Plan.

Table A2.4 details priority activities for the fisheries and marine resources sector with respect to CCA and DRR.

Table A2.4 Priority CCA and DRR actions for the fisheries and marine resources sector

Strategy	Activity	Lead
<p>Fill knowledge gaps – Identify and document vulnerable fisheries and marine resources</p>	<p>Collect and analyse fisheries and marine resources data in conjunction with assessments of climate change and disaster impacts on coastal resources. Includes establishing programs for regular monitoring of fish resources, ensuring active community participation.</p> <p>Development of effective monitoring, control and surveillance (MCS) capability, through national programmes and regional cooperation.</p>	<p>NFMRA</p>
<p>Support a community based ecosystem approach to fisheries management (CEAFM)</p>	<p>Strengthen the community fisheries program of NFMRA, to support CEAFM.</p> <p>Develop integrated fisheries management plans, through community consultation, which integrate future changes and risks due to climate change.</p>	<p>NFMRA</p>

¹¹ Bell, J.D., Johnson, J.E. and Hobday, A. (editors), 2011. Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change. Secretariat of the Pacific Community, Noumea, New Caledonia.

¹² The convergence of PEQD and the Warm Pool, which creates prime feeding areas for tuna, is expected to move eastwards as a result of climate change. Preliminary modelling suggests that catches of skipjack tuna in Nauru’s EEZ could increase by 20–25% in 2035 relative to the 20-year average (1980–2000) but are expected to approximate the 20-year average under a high greenhouse gas emissions scenario in 2100. Catches of bigeye tuna are projected to decrease, while trends for yellowfin tuna are expected to be similar to those for skipjack tuna.

¹³ NEISIP, 2011

Table A2.4 Priority CCA and DRR actions for the fisheries and marine resources sector (continued)

Promote aquaculture as an important contributor to food security that can reduce pressure on coastal fisheries	Assess the impact of drought on aquaculture and develop management tools. Investigate contamination of Buada lagoon from the waste dump site, and determine strategies to prevent further contamination Finalise an action plan for aquaculture development	NFMRA
Strengthen the human capacity of government and community stakeholders	Promote and facilitate human resource development through fisheries education and training programmes . Specifically, increase local capacity in aspects of marine science, including fisheries techniques, monitoring and analysis of resources and any impacts of climate change, coastal and marine resource management practices, and seafaring Increase local capacity to support aquaculture expansion.	NFMRA

The Nauru Fisheries and Marine Resource Management Authority (NFMRA), a statutory corporation under the Nauru Fisheries and Marine Resources Authority Act 1997, is responsible for fisheries management including overseeing, managing and developing the country's natural marine resources and environment.

Institutional strengthening and mainstreaming

- The key legislative and policy frameworks governing Fisheries and Marine Resources are the Nauru Fisheries and Marine Resources Authority Act 1997, the Fisheries Act 1997 and associated regulations. These need updating and strengthening, taking account of possible changes in fisheries resources as a result of climate change; and
- Greater capitalisation of economic benefits from fishing beyond the territorial sea, through strengthening of Nauru's skills in trade negotiations.

A2.5 Disaster management and emergency response

The practice of Disaster Management (DM) and Emergency Response (ER) implies strengthening preparedness, response and recovery systems for potential extreme events or disaster scenarios. Potential major disaster situations that require planning for include:

- Medical service disruptions, due to supply chain interruptions (medical supplies, energy, water) or flooding of infrastructure;
- Acute water and food shortages, for instance during droughts or supply chain interruptions;
- Extended energy shortages, which also reduces water production and thus threatens water security;
- Coastal erosion and inundation, which threatens houses and key assets located on the coastal strip; and
- Security risks and/or civil unrest, for example as a result of breakdown in services (energy, water, food) delivered to the Regional Processing Centre.

Climate change may alter and/or intensify traditional disaster risks, and thus it is important that DM and ER planning take account of future climate scenarios and risks. For instance, water security concerns may become even more acute since climate change is projected to alter the ENSO system which strongly influences Nauru's weather patterns. Also, storm surges and flooding may increase, due to sea level rise and heavy rainfall respectively, increasing coastal erosion and thereby threatening public infrastructure and private housing, particularly in low lying areas such as Anetan, Anibar, Anibare, Ijuw and Menen.

Table A2.5 details priority CCA and DRR activities for the disaster management and emergency response sector which have not already been articulated by other sectors. These focus on improving preparedness, strengthening institutional capacity and creating community awareness about disaster response.

Table A2.5. Priority disaster management and emergency response actions contributing to CCA and DRR

Strategy	Activity	Lead
Improve community preparedness and response systems	Implement community awareness, training and education, including a community outreach strategy to develop and maintain high levels of community awareness and preparedness for responding to extreme events. Establish a multi-hazard early warning system for disaster events. Build the capacity of response agencies (Fire, Police, Ambulance, Marine Search and Rescue)	NDRMO
Fill knowledge gaps and ensure access to information	Compile vulnerability assessments for Nauru relating to disaster risk, climate change and climate variability, as the basis for identifying future priority actions.	NDRMO

Oversight of DRM activities lies with the NDRMO (which resides with CIE), supported by high-level guidance from the National Disaster Risk Management Council. Coordination of emergency response is at present the responsibility of the Police department.

Institutional strengthening and mainstreaming

There are some important policy and planning gaps that need to be filled to strengthen disaster management and emergency response, specifically,

- Update and finalise the DRM Plan 2008. The Plan is still in final draft form and needs updating, while the DRM Act also needs reviewing (not least because institutional arrangements for DRM have changed since 2008, for instance with the establishment of the NDRMO in 2010).
- Strengthen the human capacity of the NDRMO and of the Climate Change Unit. At present expertise and institutional memory is concentrated in very few people.
- Develop clear national plans and guidelines for emergencies, including procedures to mobilise and coordinate emergency relief. This includes finalisation and implementation of the Drought Management Strategy.
- Re-establish the national coordination centre for emergency response. Under the DRM Act 2008 responsibility was designated as being with the Police, however since then responsibilities have changed. Furthermore, the police coordination centre is physically located by the coast, which is itself vulnerable during extreme coastal events.

A2.6 Energy

The energy sector can play a critical role in helping to improve Nauru's coping and adaptive capacities with respect to climate change, and to development goals generally. Energy services provide a tool for reducing vulnerability through, for instance, economic empowerment and the delivery of health and education services.

Electricity production is currently reliant on imported diesel, and thus places a significant burden on the government's limited financial resources. Import-dependency also creates supply risks. Further, energy production is closely linked to water production, since the reverse osmosis desalination units are energy intensive. At the same time, energy infrastructure is located in the coastal strip, and thus susceptible to particular climate and disaster risks which need to be considered in future planning.

From a disaster perspective, a key concern is the potential for outbreak of fire at the tank farm area. The fire protection system at the tank farm is presently not functioning, and is also not of sufficient capacity to extinguish a major fire. Such an event would have major implications for provision of energy to the island, both during the disruption and for quite some time after given limited alternative infrastructure available should the facility be destroyed. The possibility of energy shortages, arising from for instance fuel supply disruptions and/or problems with the power station, is also a critical concern.

The Energy Roadmap endorsed by the government in 2014 sets out strategies and activities in six thematic areas, namely: power, petroleum, renewable energy, demand side energy efficiency, transport, and institutional strengthening and capacity building. Progress implementing the Roadmap will contribute directly towards helping Nauru adapt to climate change and reduce disaster risks.

Table A2.6 highlights several actions from the Roadmap as CCA and DRR priorities. These are emphasised by the RONAdapt because they are considered by the Roadmap as “high priority” actions to strengthen the sector and/or because they clearly address multiple resilience goals at once. It is noted that there is a particularly strong link between the energy and water sectors, and thus many of the Roadmap’s priorities targeting energy security and closely intertwined with the achievement of greater water security. In addition, one DRR priority relates to addressing a specific high-consequence risk at the tank farm storage area.

Table A2.6 Priority CCA and DRR actions for the energy sector

Strategy	Activity	Lead
Reduce electricity demand for water	Identify opportunities for electricity savings from water pumping and RO units, and by reducing leakages in the reticulation, delivery and storage systems /tanks	NUC
Expand renewable energy capacity	First tranche of solar energy capacity expansion. Initially to be progressed through: <ul style="list-style-type: none"> • Preparation of a Solar Feasibility Study and technical standards and specifications for all phases of solar installations; • Identification of potential sites for solar, including survey of roofs of government owned buildings, power poles, parking lots for PV and locating land on Topside for potential large scale solar plants; and • Tendering for, and installation of, the first 600 to 1000 kWp of grid-connected solar without storage. 	NUC, CIE
Reduce transport fuel use while ensuring mobility	Design and introduce incentives to increase the use of bicycles and motorcycles for personal transport , as well as car-pooling and other behavioural changes to encourage energy efficiency	CIE
Improve local capacity for managing and maintaining a sustainable energy sector	Facilitate development of appropriate local skill base to meet future demand in the energy sector through various forms of training in energy efficiency and renewable energy . Includes building capacity to install, operate and maintain solar PV systems	CIE
Reduce risk of major fire outbreak at tank farm, and subsequent disruption to energy services	Upgrade and expand fire protection system for tank farm area	NUC, NDRMO

Institutional strengthening and mainstreaming

The Energy Roadmap identifies a swathe of institutional strengthening activities for the sector. Several are highlighted here as important substantive steps towards building a stable, well managed energy sector and thus contributing to the overall resilience of Nauru:

- Develop a legislative and governance framework for the energy sector;
- Develop supporting regulations for the NUC Act; and
- Establishment and staffing of an energy unit within the department of CIE, to fill the current gap in management of the sector within government.

A2.7 Land management and rehabilitation

Land is a scarce resource in Nauru and much of the island has already been degraded by mining activities, which are ongoing. In addition, the Regional Processing Centre has been developed quickly and as a result one of the camps was erected directly over land proposed in a draft Land Use Plan as a conservation area (where there is fertile “black soil”), resulting in a loss of important soil resources that could support biodiversity as well as agriculture. Around the coast, cemeteries are full which means families are burying deceased relatives by their houses, posing a contamination risk to the groundwater lens.

A related issue is that of waste collection, disposal and management. The dump site has very little available capacity, and is being further stressed by the large quantities of waste (mainly plastics) generated by the RPC. Moreover, the existing dump site is not lined, leading to concerns about possible migration of contaminated leachate into Buada lagoon. A new disposal site needs to be identified and prepared. Waste management is also challenged by the fact that there are few assets available on-island for supporting community waste collection (trucks and skips), and these are heavily occupied by the RPC.

At present Nauru has no endorsed land use plan to guide development decisions. Land use planning is critical to, for instance, ensure that future infrastructure investments are coherent with the visions and needs of all of Nauru’s communities. A Master Land Use Plan proposed to set out future development aspirations on Topside will be broadened to a whole-of-island land use plan, to provide strategic direction to land rehabilitation and to decisions on future land use (including siting of new infrastructure). Given that major infrastructure sectors such as energy and water have developed, or are developing, investment plans covering the next decade or more, preparation and endorsement of a Nauru Land Use Plan is becoming an urgent priority.

Table A2.7 identifies CCA and DRR priorities relating to the management of land resources, focusing on those not already raised in other sections of the RONAdapt (noting that there is a strong overlap with coastal management issues described in the section below).

Table A2.7 Priority land management actions contributing to CCA and DRR

Strategy	Activity	Lead
Increase availability and productivity of land resources	Continue to implement effective land rehabilitation of Topside, in order to increase long-term availability of land for agriculture, settlement, infrastructure, and social services (e.g. cemeteries) Plant coastal vegetation such as salt bush trees to protect other vegetation from wind and salt spray, and to reduce soil erosion. (co-benefit for agricultural production)	NRC, RONPhos, Community
Improve waste management to reduce land degradation and contamination risks	Identification of new landfill site (as part of developing a Nauru Land Use Plan, see below), and preparatory work to design, construct and commission a new landfill. Train local livestock farmers on animal waste management technologies to reduce public health risks and environmental pollution.	NRC, CIE

Institutional strengthening

The following are priorities in relation to land management:

- Preparation and endorsement of a Nauru Land Use Plan (broadening the Master Land Use Plan proposed for Topside to focus also on Nauru’s coastal areas) which integrates climate and disaster risks. The plan will incorporate the concept of Integrated Coastal Zone Management, and should link to the priorities identified in sectoral plans including the Energy Roadmap, the forthcoming Water and Sanitation Master Plan, the NBSAP, Solid Waste Strategy, the Strategic Plan for the Sustainable Development of Agriculture, community development plans, and RONPhos and NRC operational plans regarding future mining. The plan should also be developed through close consultation with the community.
- Finalisation and endorsement of the draft Solid Waste Strategy 2013 and the Solid Waste Action Plan.

A2.8 Infrastructure and coastal protection

In relation to CCA and DRR specifically, consideration of infrastructure is critical for two main reasons. Firstly, as highlighted by the NSDS, strategic infrastructure can play an important role in improving economic productivity and/or reducing community vulnerability, and thus in making Nauru more resilient. The 2011 Nauru Economic Infrastructure Strategy and Investment Plan (NEISIP) identifies the government's needs and immediate priorities in the infrastructure sector, focusing on short and medium term needs relating to transport, water, sanitation, waste management, telecommunications and government buildings (including schools and hospitals). For example:

- The sea and air ports are critical assets to ensure supply of essential goods and services (food, fuel, parts, medical supplies), as well as for export of phosphate and dolomite;
- Improving drainage systems will reduce flooding during heavy rains, which restricts mobility and is also linked with water-borne illnesses (and therefore linked to health outcomes);
- Expanding renewable energy capacity will improve energy security and should also over the medium term reduce energy-related expenditure by government, thereby freeing up limited resources for other pressing development needs (see Section A2.6);
- Expanding public water storage capacity can make water and agriculture outcomes more resilient to climate variability and change, and also have benefits for energy since greater water storage can reduce peak energy demands by spreading the load that is required for water production (see Section A2.1); and
- Rehabilitation of mined areas can expand scarce land resources for settlement, agriculture, energy infrastructure, waste disposal and cultural practices (see Section A2.7).

Secondly, infrastructure needs to be designed and managed with future conditions in mind, sometimes referred to as being "climate proofed" and able to withstand disaster events. Sea level rise and associated coastal erosion, flooding during extreme rainfall events, storm surge and fires are hazards that may threaten vital infrastructure.

The majority of Nauru's housing and its economic infrastructure are located in the low-lying coastal strip, including power generation, water treatment, roads, RONPHOS plant, air and sea ports, and medical services¹⁴. The RON Hospital is low-lying and floods during heavy rains, and Nauru Government Hospital – which contains the dialysis units, public health sectors, children's clinic, diabetes clinic – is susceptible to coastal erosion. Nauru secondary school and the catholic school in Ewa district are also potential erosion risk sites. Both the Police station (which is also the Emergency Coordination Office) and the prison are immediately by the coast, and although there is an existing coastal protection structure in this area there is also evidence of ongoing erosion and subsidence of buildings (some prison buildings are no longer useable because they are unstable). In addition to public infrastructure, most communities are in the coastal strip which means most people's homes are at a low elevation. Many of Nauru's key assets, therefore, are vulnerable to coastal-related hazards, including sea-level rise, storms and flooding – which are projected to intensify under long term climate change.

In addition to infrastructure priorities highlighted in other sectors (particularly energy and water), key CCA and DRR objectives for infrastructure planning and investment are to reduce loss and damage of infrastructure due to coastal erosion and to reduce the frequency and intensity of flooding of coastal areas during heavy rains and/or storm surge. To support development of a Nauru land use plan that incorporates an Integrated Coastal Zone Management Plan (ICZMP), an assessment of coastal activities and management practices, as well as biophysical coastal processes, is necessary for making informed decisions. The ICZMP component of the Nauru land use plan will provide management strategies relating to planning, siting and design of coastal structures (including guidance on climate-proofing), prioritization of the need to renovate or remove badly dilapidated infrastructure situated at or near the coast, and replanting of coastal vegetation in exposed areas. The plan would also guide the integration of climate and disaster risks into major infrastructure development planned under the NEISIP.

Table A2.8 summarises priority CCA and DRR activities relating to infrastructure and coastal management.

¹⁴ The Pacific Catastrophe Risk Assessment and Financing Initiative report (2011) provides data on the location of key infrastructure and potential damage costs due to future disaster events.

Table A2.8 Priority infrastructure and coastal management actions contributing to CCA and DRR

Strategy	Activity	Lead
Reduce coastal risks to key infrastructure	Conduct coastal vulnerability assessment and mapping , with strong focus on community involvement, to identify key infrastructure at risk from coastal hazards and identify options to reducing risks (also in Coastal Management section). Assessment of coastal activities and management practices, as well as biophysical coastal processes, as a platform for making informed coastal management decisions. Develop an Integrated Coastal Zone Management Plan (as part of a Nauru Land Use Plan), identifying priority areas for reinforcement/protection, adjustments in land management, and possible relocation needs for specific high risk assets.	CIE
Reduce flooding occurrence and intensity	Develop and implement heavy rainfall and local flooding contingency plans Design and construction of drainage infrastructure , to reduce flood risks in critical locations	PAD, NDRMO

Institutional strengthening and mainstreaming

The absence of an over-arching coastal zone management plan hinders coordination between government agencies and communities regarding management of the coastal zone. There is also presently no environmental legislation or building codes that govern development activities. These gaps result in limited formal integration of environmental considerations into the policy making and development planning processes. Therefore, priority institutional actions include:

- Develop and implement an Integrated Coastal Zone Management Plan (ICZMP), which integrates climate and disaster risks. Over time, this should be integrated as a component of a wider Nauru Land Use Plan (see and management section above);
- Develop a Code of Practice for coastal structure design and engineering, including clarity around the environmental assessment process for new development. The code should also support consideration of climate- and disaster-related risks in infrastructure planning. Clear land management guidelines will help ensure that future development is appropriately situated, designed and constructed to reduce coastal risks. As above, this could over time be integrated into a wider Nauru Land Use Plan.
- In the short term, establish a Task Force for coastal zone management, involving CIE, Foreign Affairs, NRC, the Chief Secretary's Office and NFMRA. In the longer term, establishment of a coastal zone management unit in the department of CIE – with close working links to NFRMA – which can build government capacity and coordinate the resources needed to sustainably manage Nauru's coastal zones.
- Integrate a recognition of potential climate change and disaster impacts, and thinking about vulnerability and risk reduction, into future updates of the NEISIP. The approach used for prioritising infrastructure should specifically consider the needs of Nauru's most vulnerable people and also explicitly emphasise how different activities will function under future conditions (i.e. how well "climate proofed" key infrastructure is).
- Support human capacity development in maintenance and management of core infrastructure assets. The NEISIP identifies proper asset maintenance as a much more cost-effective approach to service delivery than capital expenditure.

A2.9 Biodiversity and environment

A range of issues that affect the health of Nauru's environment and its access to natural resources have been highlighted in other sections. In addition to those mentioned already, other problematic issues include:

- Wastewater treatment and disposal. Septic tank sludge and the salt water sewage system at Location discharge directly onto the reef (and close to the intake for the desalination plants),

while the desalination units discharge saline wastewater directly into the sea. The consequences of these discharges on near-shore ecology have not been assessed. Sludge management is made difficult at present by there being no sludge truck, meaning sludge pits sometimes overflow (especially when it rains) leading to contamination of flood waters and consequent health risks.

- Invasive species pose a threat to native biodiversity.

Protection of scarce land and soil resources is an important issue for reducing environmental degradation and improving the overall health of Nauru’s environmental resources (discussed in Section A2.7), as is addressing water contamination (discussed in Section A2.1).

A National Biodiversity Strategic Action Plan (NBSAP) was first prepared in 2010, and updated in 2014. A goal of the 2010 plan was “an annual increase of 2% to enhance, develop and manage current conservation and rehabilitation of biological diversity and ecosystems to increase the percentage of Nauru’s protected and conserved areas from the existing 2% of total land, including coastal areas, to 30% by 2025”. Successfully implementing the NBSAP will improve Nauru’s environmental health, and thus its resilience to climate change and extreme events. In 2013, SPREP undertook a Rapid Assessment of Biodiversity, which identified the presence of invasive species. This assessment led into a review of the NBSAP, and a second version was completed in 2014.

Table A2.9 summarises priority biodiversity actions that contribute to CCA and DRR.

Table A2.9 Priority activities for environment and biodiversity related to CCA and DRR

Strategy	Activity	Lead
Designate areas for conservation of biodiversity	Land use planning to identify and protect areas of high conservation value Establish conservation areas, in partnership with the community Encourage breeding of resilient indigenous livestock species, especially of pigs and poultry	CIE
Protection of flora and fauna	Implement programmes for the eradication and control of invasive species	

Institutional strengthening and mainstreaming

- The revision of the National Biodiversity Strategic Action Plan should be endorsed by Cabinet.
- The draft Environment Act 2006 needs updating and formal endorsement by Cabinet.
- Environmental Impact Assessment (EIA) legislation needs to be developed, adopted and enforced, to minimise the impacts of future development activities on Nauru’s environment.
- Facilities and procedures for border control and quarantine services need to be strengthened.

A2.10 Community development and social inclusion

Strong social linkages, a sense of culture, empowerment of disadvantaged individuals or groups, and greater engagement of people in managing their local environment and supporting their local community can all play an important role in strengthening the resilience of Nauru to future scenarios in which climate change, disasters or other stresses may present new challenges. Community development activities encompass a wide range of issues, from empowerment of women, youth development and engagement in community building activities, the strengthening of social networks and improving livelihood opportunities for households and small businesses.

Important strategies identified in Nauru as important for building community include actions to:

- Preserve Nauruan language and cultural heritage. Through collecting and preserving cultural resources including historical books about Nauru, translation into Nauruan language resource books found abroad such as about Nauruan myths or traditional medicines, including Nauruan language components in the school curriculum, and undertaking research into, and encouraging

sharing of, traditional knowledge possessed by elders. the longer term, the vision is development of a museum archive to give communities access to important cultural resources.

- Support for Women’s and Youth Affairs. Through the operation of safe houses or shelters from domestic violence, counselling services, improving access of women to education, health services, the protection of women from violence, and forums that provide support for men (such as through the SHED program), focusing on men’s behaviour in the household and society, particularly with respect to violence.
- Support for Family and Community Services. Through child protection programs, improving the livelihood and participation of disabled Nauruans (such as the development of a “disability village”), and engaging youth in community initiatives.
- Promote community participation in livelihood opportunities from small business. For instance, in the tourism sector the aims is to establish tourism as a viable, commercial livelihood strategy for Nauru, with a focus in the near term on developing services and products, through incentive programs and capacity building for communities to be better able to pursue opportunities.

In complement to these, it is important for CCA and DRR planning, including the RONAdapt, to take account of gender. Men and women often have different roles and responsibilities in Nauruan society, as well as different entitlements or access to resources. These gender differences create differences in people’s livelihoods, health, mobility, financial capabilities, and access to information, amongst other things. Empowerment of both men and women is important if Nauru is to become more resilient to future threats, and also to take advantage of future opportunities.

Nauru is a signatory to the Convention for the Elimination of all Forms of Discrimination against Women (CEDAW). The Government has emphasised gender equality and empowerment of women through, for instance, the establishment of the Women’s Office in 1997. The work of the Department of Women’s Affairs is directed by a five year Plan of Action for Women which is closely linked to the NSDS, and a Women’s Policy is also in development. Gender is an important theme in the 2009 revision of the NSDS, which highlights that as of 2009 only 34% of females over the age of 15 were in paid work, there were no women in parliament and very few in positions of influence in government departments or State Owned Corporations, and high rates of gender-based violence.

Like CCA and DRR, gender is a cross-cutting theme, which means it should be incorporated into the planning, design and implementation of activities by all government ministries and utilities. Through the priorities described in other subsections, the importance of addressing gender is already embedded in a number of ways:

- Some actions generate outcomes that are particularly beneficial for certain groups. For example, those which increase water security have important benefits for women in particular, since in Nauru the burden of water management at the household level tends to fall disproportionately upon women and thus water stress imposes greatest hardship on women;
- Some actions imply understanding how vulnerability to climate change is unevenly distributed in the community, and how gender and other factors places some people at greater risk than others. Understanding this means that future actions can then be directed more at higher risk individuals or groups. For example, those which fill information gaps by data collection and vulnerability assessments should specifically collect information on differences by gender; and
- Some actions aim to empower and harness the potential of women as agents of change in Nauru. For example, those which build capacity of households to participate in kitchen gardening, or community-based approaches to fisheries management, where these include women.

In addition, addressing gender as an issue in CCA and DRR means ensuring equal and meaningful participation by men, women and youth in planning and decision making. The views and needs of each should be sought and taken into account when climate- and disaster-related activities are designed, implemented and evaluated. It also means ensuring equitable access to resources, not only financial resources but also access to information and knowledge, to empower individuals to be able to plan and respond to different situations.

Table A2.11 identifies several priority actions related to community development and the promotion of social inclusion, which represent important steps towards increasing community empowerment, and hence also increasing resilience.

Table A2.11 Priority actions relating to community development and social inclusion contributing to CCA and DRR

Strategy	Activity	Lead
Take greater account of gender in planning	<p>Introduce gender budgeting at the national level. This provides a breakdown of how resources are benefiting men and women and is a tool for helping to ensure the most vulnerable are given priority.</p> <p>Introduce a requirement for gender budgeting in all future projects supported by development partners.</p> <p>Support more widespread use of gender disaggregation in national and sectoral data collection programs, for instance in assessments of vulnerability or disaster losses, land ownership, formal and informal labour participation, and energy usage.</p>	<p>PAD, Ministry of Finance Development partners</p>
Strengthen communities	Continue to implement the strategies of the Ministry of Home Affairs, focusing on women's affairs, family and community services, youth affairs, and the preservation of culture and language.	Ministry of Home Affairs

Institutional strengthening and mainstreaming

- Finalise and implement the Women's Policy.
- Develop nationally suitable template for gender budgeting, and train staff from Finance and other departments in how to implement gender budgeting.

A2.11 Education and human capacity development

Limited human capacity is a major challenge for delivering on sustainable development aspirations in Nauru, and also constrains the country's capacity to adapt to climate change. Few students are pursuing education in technical fields such as science, technology, ICT and healthcare, meaning Nauru is heavily dependent on expatriate expertise. Education deficits also limit the possibilities for Nauruans to participate in labour migration schemes in the Pacific, which could otherwise help boost local revenues and support livelihoods.

Education is an important factor in developing the human capacity necessary for sustainable development and for building resilience to climate change and to potential disasters.

In addition to building the basic capacities needed to implement Nauru's development strategy, various sectors have emphasized the need to build into the school curriculum and other community education channels a greater focus on social and environmental vulnerability, including the way this may be influenced by climate change and potential disaster events. Accordingly, some capacity building activities are already highlighted in other sections of this Annex.

Table A2.10 identifies an additional action to those already raised elsewhere which can contribute to improving the resilience of Nauru to climate change and to future disaster events.

Table A2.10 Priority education sector activities contributing to CCA and DRR

Strategy	Activity	Lead
Skills transfer to local Nauruans during development projects	Require that development partners specifically build a skills transfer component into projects and programmes which they support in Nauru.	PAD

