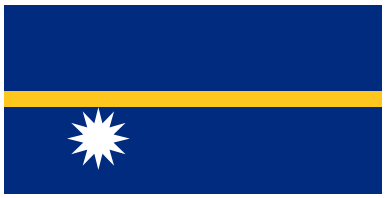

CONVENTION ON BIOLOGICAL DIVERSITY

Sixth National Report of Nauru

October 2019

Department of Commerce, Industries & Environment

GOVERNMENT OF NAURU

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Executive summary

This Sixth Annual Report to the Convention on Biological Diversity provides the most recent and up-to-date information on Nauru's efforts in the conservation and sustainable use of its biological diversity and ecological systems. The timing of the report is pertinent, given that it is at the eve of the time-frame for the global Biodiversity Strategy and the Aichi Biodiversity Targets.

There are five key sections of the report that cover Nauru's national biodiversity priorities, their implementation and progress being made, and how they contribute to the overall ABTs, and updating of the state of biodiversity.

1. Information on the targets being pursued at the national level;
2. Implementation measures taken, assessment of their effectiveness, and associated obstacles and scientific and technical needs to achieve national targets;
3. Assessment of progress towards each national target;
4. Description of the national contribution to the achievement of each global Aichi Biodiversity Target;
5. Updated biodiversity country profile.

Although Nauru's biodiversity priorities are not in alignment with the ABTs, many of the activities reflect the nuance of the global biodiversity strategy. The national biodiversity strategic action plan (NBSAP) captures Nauru's biodiversity priorities, which has since been enhanced by Nauru's National Integrated Environment Policy (NIEP).

Nauru has adopted eight thematic areas under its National Biodiversity Strategy and Action Plan (NBSAP).

These biodiversity thematic areas and goals are in alignment with the overall outcomes of the global biodiversity strategies and the ABTs. The majority of the national biodiversity activities are ongoing; hence, many are not time-bound. Since the development of the NBSAP, the National Integrated Environmental Plan (2019) has now replaced the National Environmental Management Strategy (1996). The implementation of the NBSAP remains a challenge primarily due to funding and capacity constraints. The NBSAP is in need of a review and update to reflect the current Global Strategic Plan for Biodiversity and the associated Aichi Biodiversity Targets, or what will be the new targets post 2020.

While much progress in implementing the NBSAP (NEMS) has been made, tracking of these achievements in a single place is needed. We have attempted to capture and highlight some of the implementation achievements through these case studies.

Nauru's National Environment Management Strategy recognises the insurmountable challenges faced by Nauru, challenges that will need to be overcome in order to achieve sustainable development. These challenges include:

- Land degradation, including severe degradation due to phosphate mining, coastal erosion and loss of soil.

- Inadequate environmental education, public awareness and training, including loss of traditional environmental knowledge and awareness, inadequate public environmental awareness, and inadequate environmental and science education.
- Inadequate environmental infrastructure and legislation, including the need for land tenure reform and the development of an environmental data base.
- Loss of biodiversity, including the loss of both species and ecosystem diversity and the loss of traditional varieties of important cultural plants.
- Coral reef and marine resource degradation and overexploitation, including the breakdown of traditional marine tenure and resource-use systems, the inability to optimally exploit pelagic and deep-sea fisheries resources, and the breakdown of the traditional aquaculture system.
- Pest and disease infestations, including the need for the strengthening of quarantine procedures to ensure that serious new pests and diseases are not introduced into Nauru.
- Pollution and waste management, including the problems of solid waste management, water pollution, sewage treatment, air pollution and noise pollution.
- Population growth and urbanization.
- Health and nutritional deterioration.
- Economic vulnerability and instability.
- Inadequate development infrastructure and services.
- Global climate change, in particular the threats posed by sea-level rise due to global warming and increasing ultraviolet radiation due to the breakdown in the Earth's protective ozone layer.
- Radioactivity and nuclear pollution and their known detrimental effects on human health and the environment.
- International traffic in toxic and hazardous waste

The challenges identified some 25 years ago remain the same today, and in many circumstances they have worsened. The lack of implementation, which may be attributed to limited human and financial resources, new and emerging issues that were not foreseen, and the deterioration in global affairs (in particular climate change and its impacts) continue to put pressure on Nauru and its people. Despite these, some actions have been taken with success noted

The National Integrated Environment Policy (NIEP) is the most recent environmental strategy that updates and replaces the existing NEMS. The NIEP builds on 7 major thematic areas that are often used in assessing the state of environment process. As this is a continuation of the previous NEMS and NEAP 1996, many of the activities are continuing. There is a need to track progress in a logical way so that outcomes can be measured and resources can be prioritised to address the gaps.

Our understanding of Nauru's biodiversity status is now at an all-time high, with good baseline information generated over the past few decades. The drivers and pressures that are threatening the integrity of the country's biodiversity and ecosystems remain a critical concern and, in many instances are likely to worsen.

The indigenous flora and vegetation of Nauru are limited. There are no endemic plants. The total number of vascular plants, including introduced species, amounts to over 500. The introduced species consist mainly of ornamentals, weed species, food plants, and a number of other useful cultivated plants. Because of the unique adaptability of indigenous Pacific Island plants to the harsh conditions of coastal and small-island environments, and their cultural and ecological utility, their protection and enhancement are crucial as a basis for sustainable development in Nauru.

Nauru contains a moderate number of bird species, which are important to the biodiversity of the island, as well as key to the cultural wellbeing of the people. A total of 36 bird species are recorded from the island. Nauru has been an important nesting area for seabird populations, as evident by its guano history. Only one endemic bird species, the Nauru Reed Warbler (known locally as *Itsirir*) (*Acrocephalus rehsei*), is common over most of the island except for recently mined areas. The Micronesian pigeon (*Ducula oceanica*) now exists on Nauru in very small numbers, probably a population of 50-150 birds.

Surveys of the black noddy (*Anous minutus*) and brown noddy (*A. stolidus*) indicate that they are being harvested faster than they can breed. The harvesting of seabirds is a serious concern, with well over 300,000 black noddy taken annually. Frigate birds (*Fregata minor* and *F. ariel*) are captured and tamed for traditional sport. Approximately, 310 frigate birds are captured yearly, and a big proportion (120-150 birds) die during their capture. Seabird populations have declined in Nauru, and the most impacted are Frigate birds, black and brown noddies and bristle-thighed curlew. Threats caused by invasive species, loss of nesting sites, nesting site disturbance and unsustainable harvesting for sport and food are contributing to this decline.

There is a healthy live coral cover 44-78% and in good condition. 51 species of hard coral have been recorded, although it is estimated that Nauru reefs may contain over 100 hard coral species. This diversity is considerably lower than nearby archipelagos. Species belonging to the genus *Pavona* dominated the coral reef diversity, followed by *Montipora, Porites* and *Acropora. Acropora* was said to be common in the past, but possibly infestation by crown-of-thorns starfish and coral bleaching may have contributed to their decline. Four coral species found in Nauru are of interest globally due to their vulnerability to extinction, and many are considered rare and in need of protection.

Dominant organisms on the reef flats are algae comprising the four major algal groups: Chlorophyta, Ochrophyta, Rhodophyta and Cyanophyta. In many parts of the reef flat clear zones can be seen with brown algae (Ochrophyta – mostly *Padina* sp.) dominating the high-intertidal area, green algae (Chlorophyta – comprising mostly of *Boergesenia forbesii, Microdictyon* sp., *Boodlea* sp.) dominated the mid-intertidal, and the red turf algae (Rhodophyta – *Ceramium* spp., *Polysiphonia* spp.) common in the low-intertidal to the reef crest area. The reef crest saw a mixture of red and green algae (*Dictyosphaeria cavernosa* and *D. versluysii*). Twenty new algal records for the island were found bringing the total number to 58 species

Nauru's reef fish fauna is comprised of about 407 species; it is dominated by Labridae (34 species), Pomacentridae (30 species), Acanthuridae (21 species), Chaetodontidae (21 species), Balistidae (12 species), Serranidae (11 species) and Scaridae (10 species). Although the abundance of the reef fish fauna is high relative to other nations, there are significant signs of overfishing. In a fish survey undertaken in 2012, several usually common groups of fish were under-represented, and the overall fish community structure was unbalanced with a high proportion of herbivorous species and a very low proportion of predators. The survey noted a lack of large sized fishes like groupers and snappers. Whitetip reef sharks (*Triaenodon obesus*) are in good numbers.

Nauru is known to be a range state for at least 7 migratory species listed for protection under the CMS Appendices (e.g. whale shark, blue whale, humpback whale). The total Exclusive Economic Zone was known for its abundant tuna stocks, especially skipjack and yellowfin and, to a lesser degree, bigeye. However, tuna stocks are heavily influenced by the El Niño Southern Oscillation events, with more during El Niño periods and less during La Niña periods.

The economic crisis faced by Nauru since the turn of the Century has seen a rise in fishing activities, especially reef gleaning and collecting. Fishing activity among the people is likely to increase following the repatriation of I-Kiribati and Tuvaluan expatriate workers. Previously, following the winding down of mining operations, most fishing activity was carried out by I-Kiribati and Tuvaluan nationals. Nauruans and other nationals, tend to buy fish from the I-Kiribati and Tuvalu anglers and garden fresh produce from the Chinese. The repatriation of I-Kiribati and Tuvaluan workers and with increasing numbers of Chinese nationals also leaving the island, is encouraging Nauruans to go out and gather the supplies themselves.

The major drivers that influence biodiversity in Nauru are Population Growth, Climate Change and Variability including Natural Disasters, Unsustainable Economic Development and Traditional and Contemporary values (attitudes and lifestyles). These drivers have been highlighted in previous government reports and continue to be a major priority for the Government and the people.

Nauru recognises the importance of the ABTs and the need to put in place national mechanisms and support structures to achieve sustainable outcomes. There are national challenges that are hindering progress, and therefore the successful realisation of national priorities. These same challenges are burdening efforts towards fulfilling the national commitment to international agreements. There is, however, a strong commitment by the Government and its citizens to improve their wellbeing, environment and economic aspirations for the benefit of all the people of Nauru.

Raising awareness on environmental challenges, building the capacity of communities and developing policies and strategies are some of the efforts taken by the Government, as part of its contributions towards the global biodiversity strategy and ABTs.

The challenges have been the lack and limited resources (both human and financial) towards the implementation of strategies and supporting community level initiatives. This has been compounded by complex land tenure systems when it comes to establishing conservation areas, and putting in place effective resource management systems. The variability in weather and extreme climate change impacts have contributed to challenges such as beach erosion of the narrow coastal plain, and the prolonged droughts (up to 3 years) have caused water shortages and stress to species and ecosystems.

The need to monitor and track progress is a priority, as well as continuous assistance and support by development partners and by every Nauruan citizen.

Acronyms

ABT – Aichi Biodiversity Target
BIORAP – Biodiversity Rapid Assessment
CBD - Convention on Biological Diversity
CHM – Clearing House Mechanism
CI-PIP – Conservation International - Pacific Islands Programme
CSIRO – (Australia) Commonwealth Scientific and Industrial Research Organisation
DCIE – Department of Commerce, Industries and Environment
EDGE - Evolutionarily Distinct & Globally Endangered species
EES – Environmental Education Sub-Committee
EEZ Exclusive (Extended) (200-mile) Economic Zone
EIA Environmental Impact Assessment
ERC – Environmental Resource Centre
FAO Food and Agriculture Organization of the United Nations
FFA Forum Fisheries Agency
GEF Global Environment Facility
GEF-PAS-IIB – Global Environment Facility – Pacific Alliance for Sustainability – Integrated Island Biodiversity
GIS Geographical Information System
ICZ – Inter-tropical Convergence Zone
IPCC Intergovernmental Panel on Climate Change
ISA – International Seabed Authority
MEEP – Master Environmental Education Plan
NACRDFS Nauru-Australia Cooperation Rehabilitation and Development Feasibility Study
NBSAP – National Biodiversity Strategy and Action Plan
NDA Nauru Divers Association
NDP National Development Plan
NEA Nauru Environment Association
NEAP National Environmental Action Plan
NECC National Environmental Coordinating Committee
NEMS National Environmental Management Strategy
NFMRA – Nauru Fisheries and Marine Resources Authority
NFRA Nauru Fishermen's Association
NGO Non-Government Organisation
NIC Nauru Island Council
NIEP – National Integrated Environment Policy
NOAA US National Oceanic and Atmospheric Administration
NPC Nauru Phosphate Corporation
R2R – Ridge to Reef
SCUBA Self-Contained Underwater Breathing Apparatus
SPBCP – South Pacific Biodiversity & Conservation Project
SPC – Secretariat for the Pacific Community
SPCZ - South Pacific Convergence Zone
SPREP – Secretariat of the Pacific Regional Environment Programme
UNDP United Nations Development Programme
UNFCC – United Nations Framework Convention on Climate Change

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Introduction

This 6th National Report of Nauru to the Convention on Biological Diversity (CBD) provides an overview of activities carried out to implement the national biodiversity strategy and action plan (NBSAP), and progress towards the Global Biodiversity Strategy and the Aichi Targets. The report follows the guidelines for national reporting according Decision XIII of the Conference of the Parties, that was held in Cancun, Mexico.

> **Article 26**: The objective of national reporting is to provide information on measures taken for the implementation of the Convention and the effectiveness of these measures
> **Decision X/2**: Monitor and review the implementation of NBSAPs in accordance with the Strategic Plan and national targets and report through 5NR and 6NR; Analyse/synthesize national, regional and other actions, including targets, to assess the contribution of such national and regional targets towards the global targets

The report covers the following sections:

1. Information on the targets being pursued at the national level;
2. Implementation measures taken, assessment of their effectiveness, and associated obstacles and scientific and technical needs to achieve national targets;
3. Assessment of progress towards each national target;
4. Description of the national contribution to the achievement of each global Aichi Biodiversity Target;
5. Updated biodiversity country profile.

Efforts to collect information have been hindered by a number of factors, in particular the unavailability of the corporate history that maintains, and tracks progress made through the implementation of projects and activities of the Environment Department and like-minded organisations. Until a regimented regime is adopted, as a best practice from now to the future, endeavour to capture progress will likely be thwarted by similar challenges.

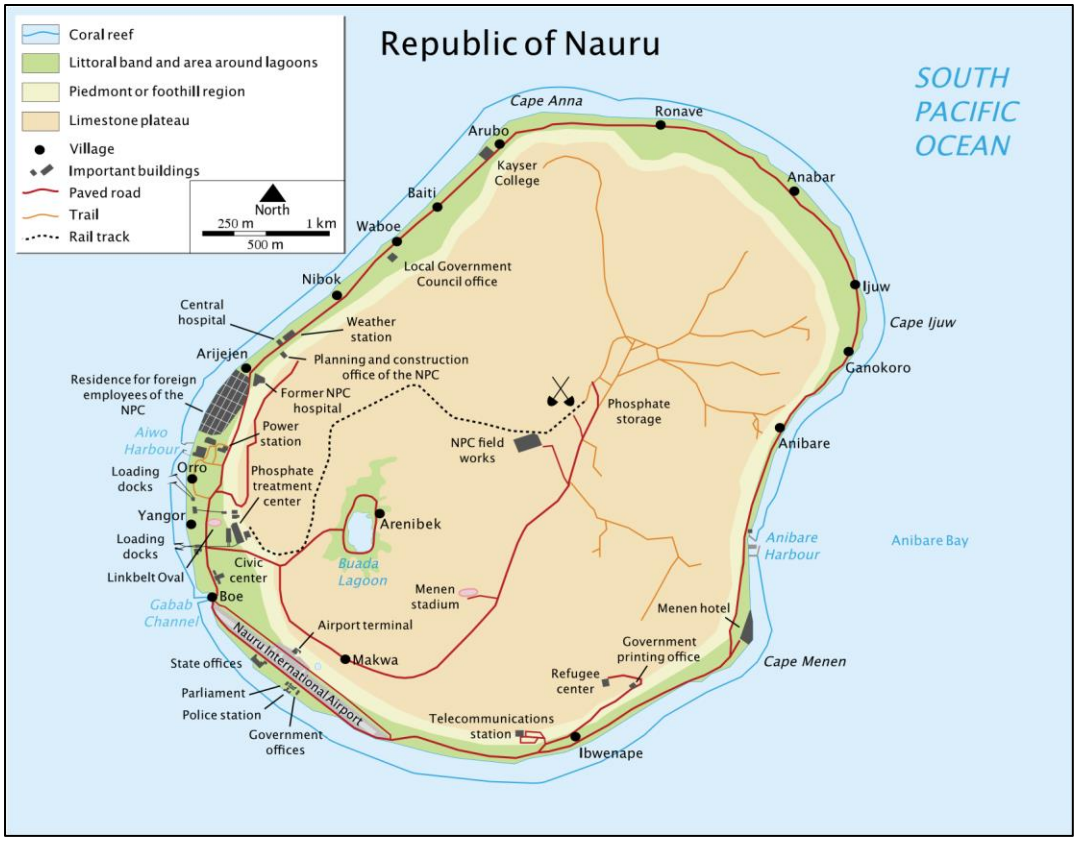

Figure 1. Map of Nauru. (Source: RON-NIEP 2019)

The Republic of Nauru (Fig. 1) is an isolated, uplifted coral-limestone (formed 0.3 to 5 million years ago) underlain by a volcanic seamount (dated to 35 million years) that rises from the floor of the Pacific Ocean. It is located about 50 kilometres south of the equator at 0° 32' S. latitude and 166° 56' E. longitude. It is some 2000 km east-northeast of Papua New Guinea, 4450 km south-southeast of the Philippines and an equal distance to the southwest of Hawaii. The nearest island is Banaba (Ocean Island), 300 km due east, which is part of the Republic of Kiribati. The Gilbert Islands, the main islands of Kiribati, lie a further 400 km to the east. The island is approximately 6 kilometres long by 4 kilometres wide, with a land area of 21 km^2, making Nauru the third smallest nation in the world.

Nauru is located in the dry belt of the equatorial oceanic zone. The monthly average temperatures are consistent throughout the year which are strongly linked to the surrounding ocean temperature (Figure 2). The diurnal temperatures range from 26°C to 35°C, and night temperatures between 22 to 34°C. The wet season usually starts in November to April, whereas the drier period occurs from May to October. Annual rainfall is extremely variable, averaging 2126 mm per year, with a range of 280 to 4590 mm. The wet season is influenced by the movement of the South Pacific Convergence Zone (SPCZ) and the Inter-tropical Convergence Zone (ICZ). These heavy bands of rainfall are caused by air rising over warm waters where winds converge, resulting in thunderstorm activity.

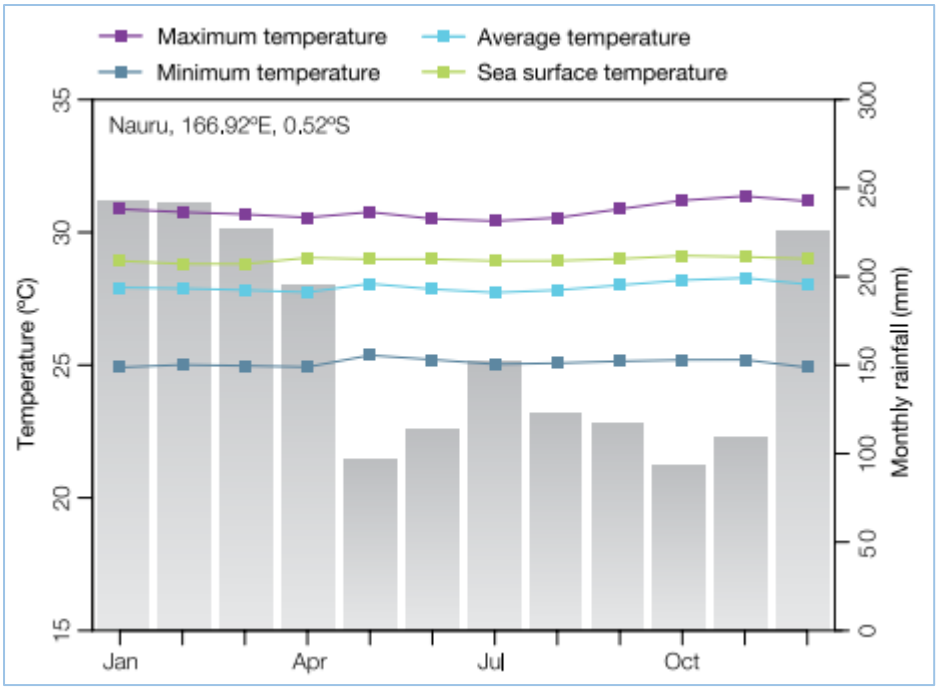

Figure 2. Seasonal temperatures and rainfall for Nauru. (Source: PACCSAP 2015)

Prolonged droughts are common and place severe stress on even the most hardy coastal strand species, lead to the death of non-coastal exotics (such as breadfruit), and severely restrict the production of even coconut palms. For example, in 1917 and 1918, when only 465 and 483 mm of rain fell, "thousands of coconuts and other fruit trees died" (Griffiths 1923).

The wind direction during the drier months is generally from the easterly sector at speeds of 5 to 10 knots, and during the wetter months is generally from the westerly sector at speeds of 10 to 18 knots. During squally weather, wind speeds of up to 30 to 35 knots have been recorded. Nauru does not experience tropical cyclones due to its proximity to the equator.

The phosphate mining industry in its heyday brought immense wealth and opportunities to the people of Nauru. However, with the closure of the mine in 2005, Nauru's economy underwent a serious downturn. During the last decade, the fisheries have contributed about 10% to the country's GDP. Notably, traditional knowledge and practices for cultivating and using a limited range of plants and animals on land and inshore marine resources, that were valuable social assets for the survival of the population in harsh environmental conditions in the past, have been revived as alternatives for food and livelihood in modern times.

Nauru's unique circumstances, in terms of its isolation, geological origins, historical and economic aspirations, have seen the country prosper to the highest level (with GDP per capita, estimated to be USD 50,000/p in the mid-1970s) (Watanabe 2018), as well as suffering economic hardship.

While national pride remains as passionate as ever, almost every other aspect of the nation needs rehabilitation. It is unsurprising that the country's vision is on rehabilitation – restoration.

Because of phosphate mining, indigenous forests have been cleared on the central plateau (Fig. 3). In response, the Government has instituted the National Rehabilitation Programme with the aim of restoring vegetation in the central plateau. The ongoing secondary phosphate mining and current activities stemming from the limestone industry are challenging the rehabilitation plan.

Figure 3. Remnants of the phosphate mining. (Image: PSkelton)

Section I. Targets being pursued at the national level

Nauru has adopted eight thematic areas under its National Biodiversity Strategy and Action Plan (NBSAP).

1. Mainstreaming Biodiversity – rehabilitation, conservation and sustainable use of biodiversity is integrated into national sectoral and cross-sectoral plans, policies and programmes.
2. Ecosystems management – commit an annual increase of 2 % to enhance, develop and manage conservation and rehabilitation of biodiversity and ecosystems to increase Nauru's protected and conserved areas from 2 % of total land to 30% by 2025.
3. Species management – promote the conservation of Nauru's native and other important species and provide mechanisms for their sustainable use.
4. Community – empower and encourage the 12 districts to protect, conserve and sustainably use and manage biodiversity.
5. Access & benefit sharing from use of genetic resources – genetic resources are accessible for utilisation, and benefits are equitably shared among the stakeholders.
6. Biosecurity – protect native biodiversity from impacts of alien invasive species and imported earth materials, through effective border control, effective quarantine and eradication programmes.

7. Agrobiodiversity – conserve and sustainably use agrobiodiversity to ensure its contribution to national development, the preservation of traditional knowledge and practices, and food and health security.
8. Financial resources & mechanisms – secure long-term sustainability of all conservation and biodiversity related programmes by way of access to funding mechanisms from local and international sources.

These biodiversity thematic areas and goals are in alignment with the overall outcomes of the global biodiversity strategies and the ABTs. The majority of the national biodiversity activities are ongoing; hence, many are not time-bound. Since the development of the NBSAP, the National Integrated Environmental Plan (2019) has now replaced the National Environmental Management Strategy (1996). The implementation of the NBSAP remains a challenge primarily due to funding and capacity constraints. The NBSAP is in need of a review and an update to reflect the current Global Strategic Plan for Biodiversity and the associated Aichi Biodiversity Targets, or what will be the new targets post 2020.

The Fifth National Report (notably the country's first report to the CBD), highlighted its commitment to the global biodiversity targets. It noted that whilst many of the national initiatives contributed to the end goal of biodiversity protection, conservation and sustainable utilisation, the paths do not align directly with those prescribed under the global biodiversity strategy. The future can only be viewed positively, if many of the initiatives are supported, and a strategic approach be adopted guiding the alignment of the country's initiatives, capability and aspirations, with those of the global community.

Section II. Implementation measures, their effectiveness, and associated obstacles or needs

While much progress in implementing the NBSAP has been made, tracking of these achievements in a single place is needed. We have attempted to capture and highlight some of the implementation achievements through these case studies. Other NBSAP outcomes can be noted in Tables 1 and 3.

Case Studies

3-D Modelling

Figure 4 Community members that built the 3-D model of Nauru. (Image - SPREP)

A Participatory Three-Dimensional modelling training held in April 2016, brought together community members, government officers, school children and non-governmental organisations to construct a 3-dimensional model of Nauru. The model is useful to demonstrate planning developments and their potential impacts to communities and ecosystems. Government agencies and community members were able to identify areas for conservation purposes, as well as sites for managing species of interest. The training and development of the 3-dimensional model was supported by the Secretariat of the Pacific Regional Environment Programme (SPREP), the Samoa's Ministry of Natural Resource and Environment, the Department of Commerce, Industries and Environment (DCIE), Technical Centre for Agriculture and Rural Cooperation under the GEF-PAS-IIB project.

Laying the foundation for future planning of marine resource management

Figure 5. Participants at the marine spatial planning workshop. (Image - Ryan Wright, SPREP)

Nauru took the first step towards marine spatial planning (MSP), a process that brings multiple users of the ocean together to make informed and coordinated decisions, on how best to use marine resources in a sustainable manner. A workshop was held in early February 2016, which was preceded by a workshop on geographic information systems (GIS). The workshop was supported by the Secretariat of the Pacific Regional Environment Programme (SPREP) and the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), and led by the Nauru Fisheries and Marine Resources Authority (NFMRA) and the Department of Commerce, Industries and Environment (DCIE). The four-day workshop brought together various government agencies, community leaders and non-governmental organisations to discuss marine resource management and the values placed by the stakeholders. Community groups were impressed with the workshop results and pledged to establish a marine managed area and explore options for improving their livelihood.

Rapid Biodiversity Assessment

Figure 6. Local staff doing flora survey. (Image: PSkelton)

A rapid biodiversity assessment was undertaken to document the major species composition and habitats of the islands. A team of international and regional experts worked alongside government staff, non-governmental partners and community members to undertake surveys in land, coastal and marine ecosystems. A swathe of new information on the biodiversity of Nauru was uncovered, including many new species records, some newly discovered and undescribed species, species that may be extinct and introduced invasive species. Recommendations from the assessment include the need for conservation and resource management to safeguard existing species, and to remove threats posed by invasive species and habitat destruction. Other recommendations include developing appropriate legislation for the protection of endangered species, and to strengthen traditional systems. The assessment was led by the Secretariat of the Pacific Regional Environment Programme (SPREP), the Department of Commerce, Industries & Environment (DCIE), and Conservation International – Pacific Islands Programme (CI-PIP).

Seabed mining regulated

Figure 7. Deep Seabed mining for minerals. (Image: IFREMER©, France)

The Nauru Government has enacted legislation to govern its seabed mineral activities within international waters known as the 'Area'. This ensures that any activities on the seabed floor will follow the international law requirements, with particular attention to the protection of the marine environment and securing equitable financial arrangements for the benefit of the Pacific nation. The International Seabed Minerals Act empowers Nauru to exercise its rights on contracts when conducting seabed mineral activities, and at the same time adhere to rules and regulations set forth by the International Seabed Authority (ISA). A national Seabed Minerals Authority will also be established under the legislation, and will be the key agency to monitor and manage Nauru's seabed mining activities. In addition a Seabed Minerals Fund is also provided for, where proceeds from mining will be remitted on behalf of the people of Nauru. The Nauru Government, in partnership with the Secretariat for the Pacific Community and the European Union, has been the key planner for this programme.

Kitchen Garden for nutritional enhancement and Food security

Figure 8. Preparing the soil for planting. (Source: GEF 5 STAR – Nauru R2R Project)

The Nauru Reef to Rdige project, working with the Department of Agriculture trained community members in the districts of Anabar, Ijuw, Anibare, Meneng and Buada to establish garden plots that will provide food for families. Members were shown how to prepare planting plots, the required tools, as well as providing a variety of fruit trees, vegetables and medicinal plants. Fruit trees such as breadfruit, dwarf coconuts, sour sop, Tahitian lime, lemon grass, ginger, bananas, sweet potatoes and Chinese cabbage were on the menu. The project will continue to encourage more households to be involved and provide assistance to those in need.

National consultations on the 3rd UNFCC Report

Figure 9. Community members participating at the 3rd National Communication for the UNFCC Workshop. (Image. Govt. Nauru)

Civil society, community leaders and government representatives assisted with the drafting of Nauru's Third National Communication report to the United Nations Framework on the Convention on Climate Change. Each participant was able to bring to the table their organisations priorities, gaps and achievements. Food and water security were identified as high priorities for most of the organisations that participated. The impact of climate change, such as beach erosion, was also noted as of high concern. The need to build local capacity was identified as one of the serious gaps in all of the organisations. Capacity needs include limited human resources, inadequate or lack of policies, lack of a good management framework and limited awareness and communication amongst the stakeholders. Financial constraints have also affected the implementation of policies. The decline of resources, both in marine and terrestrial environments, was noted as priorities by community leaders and the civil society representatives.

Section III. Assessment of progress towards each national target

National Biodiversity Strategy & Action Plan (NBSAP)

The Biodiversity Strategy for Nauru was adopted in 2010; the strategy is mostly in line with the Strategic Plan for Biodiversity 2011- 2020 (CBD & UNEP) and the Aichi targets.

The definition of Biodiversity for the purpose of the Nauru Biodiversity Strategy and Action Plan is: *The variety of life forms, the different plants, animals and micro-organisms, the genes they contain, and the ecosystems they form.* It is usually considered at three levels; genetic diversity, species diversity, and ecosystem diversity. It thus includes all the species that make up the natural world of Nauru, those which naturally occur on the island, and those brought here by people. Nauru's isolation as a single island from other land masses means that many of the species found here are endemic and their conservation is of particular importance. For the past century however, Nauru has been heavily mined for phosphate, which has led to the serious breakdown of its physical environment as well as of the socio-economic well-being of its people. This strategy, in complementing the activities of the Nauru Rehabilitation Program, aims to conserve and sustainably use these endemic species and equally to secure the future of other species, native or introduced, that are vital to agriculture, forestry and fisheries. The conservation of biodiversity is vital to the ongoing social, economic and cultural development of the nation.

Nauru's NBSAP was developed in 2009, endorsed by the Government in 2013, however is yet to be formally implemented. The NBSAP contains 8 biodiversity thematic goals (Table 1). The NBSAP is mainstreamed in Nauru's Sustainable Development Strategy which is linked to the 2015 Millennium Development Goals and the Aichi targets.

Nauru's Biodiversity Strategy and Action Plan is an integral component of its National Environment and Development Management Strategies—its response to its own, Nauru Vision for the Future and to the world wide call from the Earth Summit of 1992 for nations to re-examine their developments and make changes that are necessary to turn the tide of environmental degradation and ensure sustainability in human development.

The Strategy outlines the state of Nauru's biological resources and actions to control their degradation and achieve sustainable development. It is Nauru's foremost expression of commitment to the Convention on Biological Diversity, which it ratified in 1992). The process to revise and update the NBSAP, as well as establish national targets, in line with the global framework, is pending.

Table 1. NBSAP Themes, Objectives, Actions and Progress.

Theme	Objective	Actions	Progress
1. Mainstreaming Biodiversity	Policy	i. Include NBSAP in NSDS ii. Amend existing policies to support NBSAP	NBSAP is captured in the NSDS (Economic Sector – rehabilitated land used for … environment conservation and protection.
	Multi-sectoral collaboration	i. Enhance and strengthen the links between the Biodiversity Policy Committee, , and other government departments, NGOs, private sector and community groups to advise on the sustainable management of Nauru's biological and genetic resources, and contribute to Nauru's participation at international and regional environmental consultations. ii. Establish a multi-sectoral team of scientists and experts to conduct biological studies and undertake monitoring programmes on biodiversity. iii. Establish and maintain regular consultations and communication links between all stakeholders on international and regional treaties for the conservation and sustainable use of biodiversity	National consultations and capacity building programs are usually cross-sectors; inviting the full participation of the various government agencies, community and NGOs. Such consultations include the development of Nauru's 3rd National Communication to the UNFCC Rapid Biodiversity assessment completed through a multi-disciplinary team of scientists and supported by government agencies and community members. Ongoing community consultations through the Ridge to Reef process, such as kitchen gardens and sustainable land use
	Legislation	i. Review and Enact the Environment Legislation to incorporate relevant actions from the NBSAP ii. Develop, adopt and enforce EIA legislation to minimize the adverse impacts of developments on the environment iii. Ensure the integration of the objectives and actions of NBSAP into legislative amendments being undertaken by relevant departments, to ensure consistency across all sectors concerned iv. Integrate the protection of species from the impact of oil spill and marine pollution into the appropriate legislation v. Review the conservation status of wildlife and make appropriate monitoring and enforcement amendments vi. Develop appropriate legislation on biosecurity to include risk management on genetically modified organisms, invasive alien species, and effective border control vii. Develop appropriate legislation for the promotion and protection of traditional knowledge and equitable benefit sharing, which are important for the conservation and sustainable use of biodiversity viii. To develop in a comprehensive way a coherent philosophy and programme of action designed to protect and enhance our natural cultural heritage	Environmental legislation is still in the consultation phase. Capacity building completed for EIA, which was used to assess two project developments. Integration of the NBSAP is still work in progress. Species protection legislation needs to be reviewed and amended to take into consideration the current state of knowledge and the vulnerable nature of species. Biosecurity legislation has been developed but strong enforcement is needed as well as building capacity and provision of sufficient resources. Legislative framework needed to enhance the participation of communities and safeguard traditional practices and cultural sites.

	Environmental impact assessment	i. Develop relevant EIA system for Nauru in 2010 ii. Undertake biological surveys and assessments as an integral part of EIA procedures iii. Integrate the assessment of development impacts on biodiversity as part of the code of practice for any extraction of natural resources iv. Integrate economic valuation into EIA as an integral part	EIA system in place. Baseline information on Nauru's biodiversity completed, which will be useful in EIA application Economic valuation is yet to be considered in the EIA process.
	Capacity building	i. Develop a national clearinghouse mechanism based on the CBD-CHM for disseminating and sharing of information on biodiversity work ii. Conduct National Seminars involving all key stakeholders on policies and plans relating to conservation and sustainable management of biodiversity iii. Develop public awareness material on all legislation relating to biodiversity use for dissemination to the people of Nauru iv. Implement and coordinate media programmes to raise awareness v. Promote and encourage access to and the use of advocacy material on biodiversity available at the various government departments vi. Provide capacity building training for local communities on the principles and benefits of EIA, so they can demand the conduct of EIA on developments at the local level	The INFORM project, which Nauru is a part of, provides the Clearing House Mechanism (CHM) where all biodiversity information can be stored, accessed and shared. Ongoing awareness continues under past and the current Ridge to Reef project and Access and Benefit Sharing project. Media programs are developed ad hoc with support from various partners. Capacity building remains a challenge but awareness raising continues to be a key strategy for community engagement.
2. Ecosystems Management	Research & monitoring	i. Undertake biological surveys of Nauru's terrestrial ecosystems ii. Undertake a complete survey of Nauru's inshore and offshore biodiversity iii. Develop and implement a long term monitoring program for Nauru's native ecosystems including invasive species iv. Develop a list of priority research topics and monitoring techniques to be used by students and staff of natural resource sectors v. Develop a programme for the identification of genetic resources from Nauru's biological resources vi. Develop and implement a programme for monitoring the impacts on biodiversity from climate change	Biological surveys completed Monitoring programs are difficult to implement due to limited resources. Some monitoring programs (e.g. fruit-fly monitoring) can be long-term provided there's a support and encouragement by partners. Priority topics for research are available through consultation with community staff. Conservation areas are not yet implemented but ongoing consultations are helping in moving the issue forward.

	Conservation Areas	i. Establish conservation areas in under represented ecosystems ii. Prioritise restoration programmes of degraded ecosystems by heavy industrial and other natural causes iii. Establish large conservation areas which include more than one ecosystem in high priority sites as identified in the NBSAP process iv. Encourage the development of a representative system of marine protected areas built upon existing plans v. Develop appropriate information systems such as GIS to store and share information of ecosystems and protected areas vi. Develop a national water conservation programme to support all the priority areas and the community-based water catchment areas vii. Develop and implement restoration programmes of degraded ecosystems	Conservation areas remain to be implemented. Degraded sites have been identified including inland lagoons and topside. Potential conservation sites being identified including Buada Lagoon and norther Anibare Bay intertidal flats. 3-D mapping of the island completed providing an avenue to visualise and encourage participation by all community members. Water harvesting is being implemented throughout the country under the Ridge 2 Reef project. So far 97% of installation to participating households has been completed. Project will continue to roll out and will be targeting vulnerable households. Although little ongoing marine conservation exists within Nauruan waters, there is some history of fishing restrictions (National Assessment Report 2009). Such practise include temporary or seasonal taboos or bans on species or fishing grounds, restrictions on the consumption of certain species (for example, some species such as turtles or giant clams were reserved for chiefs or priests), fines or penalties for resource abuses, and clan tenure or limited access to reef and lagoon areas.
	Sustainable use of Ecosystems	i. Develop guidelines for the sustainable use of biodiversity resources and other natural products based on the national environmental legislation upon enactment ii. Identify sustainable management and community effort options for cultivation iii. Identify options to allow all marine biodiversity, including inland lagoons, to be managed sustainably under the guidance of the NFMRA Act and other relevant policies, guidelines and strategies iv. To identify and restore the traditional ownership, usage of their marine and terrestrial resources v. Develop and promote integrated coastal management programmes	Legislation is yet to be developed but efforts to sustainable use resources are being pursued through a number of projects and initiatives, including in the Fisheries and Agriculture sectors and the Ridge to Reef project. The new Fisheries Bill empowers communities to sustainably manage their marine resources and further encourage the use of traditional knowledge and custom, as part of the process.

	Capacity building	i. Develop and implement local capacity building programmes on biological surveys, monitoring techniques and ecosystem management ii. Establish a multi-sectoral group of national experts to coordinate and undertake biological surveys and monitoring programmes iii. Provide and implement appropriate training for communities on sustainable income generating activities iv. Establish a Conservation Management committee of key agencies to assess and review appropriate approaches for improving the management of conservation areas	Multisectoral group established and assisted with the biological assessment of the island (Rapid Biodiversity Assessment)
	Public awareness & Education	i. Establish an Environmental Information Centre ii. Develop and implement public awareness and educational programmes on the importance and management of ecosystems iii. Disseminate information on the importance of Nauru's ecosystem through local media iv. Develop a core set of public awareness material and displays on conservation for public display, promotional campaigns, and distribution to local communities	Awareness campaigns are often held as an important considerations of many projects. The Ridge to Reef project is a case in point, where not only communities are engaged, but Nauruans based overseas are encouraged through social media platforms.
3. Species management	Conservation of species	i. Maintain threatened species list and provide regular updates to regional and international directories ii. Review threatened species and develop recovery plans iii. Develop Botanical Garden to house Nauru's flora iv. Explore captive breeding programs v. Aquaculture farming in inshore lagoons and ponds	Baseline information on species diversity and status completed. Threatened species (for seabirds and indigenous plants) earmarked for development. Aquaculture Development Plan completed but needs reviewing by NFMRA
	Research & Monitoring	i. Research and update Nauru's flora and fauna ii. Survey to determine seabird population iii. Monitoring program for coral bleaching impacts iv. Monitoring program on invasive species impacts	Completed the survey of the flora and fauna of the island (both marine and terrestrial environment surveyed). Bird population surveyed. Seabird numbers are declining and endemic weed warbler thriving. Preliminary assessment for coral health indicated no bleaching, although evidence of past bleaching is noted. Preliminary finding of invasive species include the recent incursion of the island by the yellow crazy ants. Plants are some of the serious invaders undermining native species.
	Sustainable use & management of species	i. Support forest regeneration and rehabilitation at Topside and coastal areas ii. Sustainable aquaculture in freshwater and marine environments iii. Community nurseries and botanical plots for medicinal plants	Plans for rehabilitation are in place but needs support for implementation. Some efforts have started. Aquaculture Development Plan completed but needs reviewing.

	Public Awareness & Education	i. Public awareness campaigns to increase biodiversity benefits ii. Public awareness programs for sustainable use of biodiversity iii. Integrate information on sustainable use and management of biodiversity at school	A number of community consultations and awareness through the local TV has been carried out. The Ridge to Reef project holds many community consultations on issues such as sustainable land management, managed marine areas, food security and community led initiatives. Ridge 2 Reef undertook awareness campaigns in a number of local schools targeting the environment and climate change as key topics. Educational materials were distributed including pamphlets, books and posters.
	Capacity building	i. Implement capacity building programs on biodiversity surveys, monitoring and species management ii. Establish multi-sectoral group of local experts to coordinate species conservation, biodiversity surveys and monitoring iii. Implement training on community-based species conservation approaches iv. Review effective approaches for the conservation and management of species	The rapid biodiversity assessment allowed the twinning and pairing of local staff with international experts in undertaking biodiversity surveys. A very hands-on approach with demonstration on how to use equipment, deploy the equipment, collect and document the findings were showcased. Community members were also able to participate in the biodiversity assessment. A report from the biodiversity assessment includes recommendations for management plans for vulnerable species, especially birds and plants.
4. Community	Traditional knowledge, practice & innovation	i. Develop a national register to document and preserve traditional knowledge, practices and innovation for the conservation of biodiversity ii. Legislation to preserve and protect traditional knowledge, practices and innovation iii. Integrate modern science and technology with traditional knowledge practices to promote conservation and sustainable use of biodiversity	Traditional customs of Nauru are provided for in the Nauru legislation. The Custom and Adopted Laws Act 1971 and subsequent amendments recognise Nauru's rights and customs, which have an impact on fisheries and terrestrial biodiversity (Fisheries Regulations 1998, Animals Act 1982; Animals Regulations 2001). The current Coastal Fisheries and Aquaculture bill specifically includes traditional knowledge and customs, including the sharing, protection and respecting of knowledge. Many international campaigns, e.g. World Oceans Day, World Biodiversity Day often includes messages in Nauru vernacular.
	Empowering Communities	i. Implement community programs for the conservation and sustainable use of biodiversity ii. Integrate activities that promote conservation and sustainable use of biodiversity into national outreach and community programs iii. Encourage participation of communities in the coordination and implementation of conservation and sustainable use programs iv. Establish an Award Incentive Scheme for communities that promote conservation and sustainable use of biodiversity	The Ridge to Reef program currently promotes and also assists with establishing gardens with communities to assist with sustainability and food security. This is usually shared via national TV, and also on social media platforms (Facebook, Youtube and Twitter). The community participation in the Kitchen Garden in Five communities is encouraging others to be involved in growing food for families and districts. The Government legislation, especially the Fisheries Bill, aims to encourage and empower community in managing their marine resources.

	Public awareness & Education	i. Implement public awareness programmes for community leaders and groups on the benefits of conserving and the sustainable use of biodiversity ii. Conduct public awareness campaigns through media, workshops, seminars and information materials for communities to assist them with informed decision making iii. Integrate traditional knowledge into education curriculum	Public awareness campaigns have been implemented in many instances, with the latest through the Ridge to Reef program. These awareness programs are undertaken via community consultations, via national meetings or through traditional and social media.
	Capacity Building	i. Build capacity of communities in biological studies and monitoring programmes ii. Provide training for communities on their rights and procedures for reporting environment offences iii. Training for communities in the development and management of conservation programs	Building community's capacity to do biological surveys has been ad hoc due to the limited resources and opportunities available. The rapid biodiversity assessment encouraged the participation of a number of community members to get hands on experience in the work of researchers and scientists. A continuous program should be developed and supported to ensure that this learning is utilised and developed. The legislative framework is being developed to encourage more community participation in the management of their resources. The Fisheries Bill 2019 is one such legislation that recognises community leadership.
5. Access benefit sharing from use of genetic resources	Access to and equitable sharing of benefits of genetic resources	i. Develop an Environment (Bioprospecting) legislation ii. Develop procedures to help enforce legislation iii. Assess the need for a national bioprospecting coordinating body iv. Develop benefit sharing mechanisms for holders of knowledge and owners of resources v. Develop mechanisms for access to traditional knowledge vi. Identify ex-situ collections of Nauru's biodiversity and explore repatriation and restoration of ownership rights	Nauru has yet to develop its own Bioprospecting legislation. In the absence of this a number of international and regional guidelines exist to help bioprospectors and resource owners on this issue. The University of the South Pacific (USP) developed guidelines for bioprospecting. Such guidelines include ensuring that the Government of Nauru, and the appropriate land owners must provide their written consent for any bioprospecting ventures to proceed. The protection of the intellectual property rights of resource owners is also paramount.
	Public awareness & education	vii. Implement public awareness campaigns on Bioprospecting legislation viii. Conduct national seminars involving all stakeholders on access and benefit sharing programmes on the use of genetic resources ix. Coordinate and implement media programs for awareness raising	The issue of bioprospecting is yet to be considered at the national level.
6. Biosecurity	Policy & Legislation	i. Establish a coordinating committee to protect indigenous biodiversity from invasive species introduction ii. Develop Biosafety policy and action plan iii. Review the screening process for new introductions	Invasive species remain a real and serious threat to Nauru and all other Pacific Islands. Nauru's indigenous flora has been severely impacted by the mining, which is exacerbated further by the rampant overgrowth caused by introduced invasive weeds and shrubs.

	Control & Eradication	iv. Strengthen border control and quarantine services v. Develop programs for eradication and control of invasive species vi. Implement the PacPol program to protect marine biodiversity from discharge of ballast water	Nauru is currently developing its Biosecurity legislation (Biosecurity Bill 2004). The key objectives of the bill is to protect health, environment and agriculture and to facilitate trade in animal/plant products. The bill seeks to harmonize existing provisions at the national level, with neighbouring countries in the region. The Quarantine Act 1908 provides measure for the inspection, exclusion, detention, observation, segregation, isolation, protection, treatment, sanitary regulation, and disinfection of vessels, persons, goods, things, animals, or plants. Part V of the Act provides for the quarantining of animals and plants relating to their importation. The Agriculture Quarantine Act 1999, covers the exportation and other aspects of animal and plant quarantine.
	Research & Monitoring	i. Review pest species with trading partners and develop response procedures to eradicate any arrival ii. Strengthen research stations to undertake appropriate scientific research iii. Review and update Nauru's invasive species list	Nauru works closely with its regional partners, in particular, the Secretariat of the Pacific Community (SPC), to review pest species and to share information. The detection of the presence of the Yellow Crazy Ants saw the support by SPC to undertake a delimiting survey to contain or eradicate the ants. A 7-hectare area was infected and baits were deployed to try and manage the situation. Local staff were trained on identification and the deployment of baits.
	Capacity building	i. Build capacity of local staff on the screening of any new species introduction ii. Provide appropriate resources for Quarantine Staff on border control and quarantine services	SPREP provided support with species identification. SPC further provided support to control and manage invasive species. Additional support and ongoing training will be needed to help Nauru continue to monitor and control the threats.
	Public awareness & Education	iii. Develop a national public awareness program to prevent illegal introductions of invasive species	Regional resources developed by SPC and SPREP are available to be used for national public awareness.
7. Agrobiodiversity	Conservation & sustainable use of Agrobiodiversity	i. Promote sustainable use of agrobiodiversity ii. Eliminate unsustainable agrobiodiversity iii. Provide incentives that encourage conservation and sustainable use agrobiodiversity iv. Promote environmentally sound agricultural practices including integrated farming systems, agroforestry and organic farming v. Establish botanical gardens vi. Expand in situ and ex situ conservation, protected areas, aquaculture and mariculture vii. Develop programs for the preservation of indigenous species, varieties and breeds	The work by Ridge 2 Reef continues to promote sustainable use of all resources, including agrobiodiversity. The improvement of soil, including proper composting technique, has contributed to families being able to growth vegetables and fruits. These small activities can have a ripple effect and contributed to a much more healthier Nauru. There is a need now to scale up many of these excellent small scale actions, in order to get a wider uptake and impact.

	Research & Development	i. Protect native and useful species and varieties from invasive species ii. Assess threats of new biotechnologies (genetic expressions, LMO, GMO and GEO) on agrobiodiversity iii. Inventory of existing agrobiodiversity resources iv. Research and development programs for all institutions involved in agrobiodiversity	Activities to be actioned although the documentation of the flora of Nauru has been completed, which includes the majority of agricultural plants.
	Food & Health Security	i. Encourage sustainable agricultural breeding practices ii. Implement agrobiodiversity programs that increase food productivity and restore agrobiodiversity iii. Develop programs that promote the production of nutritional food iv. Improve inspection of the quality and health aspects of locally produced and imported food	Kitchen gardens established in five districts (Anabar, Ijuw, Anibare, Meneng and Buada). Build community capacity and provide resources to plan fruit trees and food crops as part of health and food security.
	Public Awareness & Education	i. National awareness programs through media, workshops and seminars to engage with communities on sustainable use of agrobiodiversity	The use of social media has been tremendous in showcasing activities for many Nauruans who live overseas. These are often shared with local Nauruans and help raise the profile of the environment and conservation activities.
	Capacity Building	i. Training to increase understanding, awareness and participation of the public to agrobiodiversity practices ii. Collaborate and coordinate with institutions that are involved in agrobiodiversity programs iii. Integrate traditional and modern practices to improve agrobiodiversity	Activities under the Ridge to Reef project are providing the opportunities for communities to be aware and to participate in agrobiodiversity practices. This provides an opportunity to strengthen and value traditional farming practices and re-connect the people with nature.
8. Financial Resources & Mechanisms	Financial plans	i. Develop long term financial plan for conservation programs ii. Increase financial assistance for conservation work through foundations and other aid donors	The level of funding support towards conservation and biodiversity has increased over the past few years for Nauru. The GEF support has been instrumental in achieving many of Nauru's activities.
	Conservation Trust fund	i. Identify funding sources ii. Establish Conservation Trust Fund iii. Explore and establish community based conservation trust funds	Activities to be actioned.
	Economic Valuation	i. Explore environmental economic valuation tools to assess the economic value of biodiversity ii. All funds generated from the economic valuation to be deposited into the Conservation Trust Fund iii. Integrate biodiversity valuation part of the land use and coastal use planning	Flagged as an important gap by the Nauru Fisheries & Marine Resources Authority in the 3rd National Communication to the UNFCC.
	Information Systems	i. Develop database of all development partners programs ii. Identify different funding sources channelled to NGOs for biodiversity implementation iii. Strengthen existing networks with donor partners	A well-intended activity that is yet to be actioned. More effort is needed to ensure that this can be achieved.
	Income-Generating activities	i. Promote sustainable income generating activities at the community level ii. Establish network with public and private sectors and donor partners to support income generating activities iii. Conduct feasibility studies for proposed income generating activities	Some level of income generating activities are being carried out by members of the community, including selling of fish catch. The Kitchen Garden, may provide an additional income for families.

	Partnership	i. Strengthen partnership with the private sector, NGOs, local communities and development partners ii. Establish special award for environmentally friendly company as part of the Exporter of the Year Award program iii. Establish award for environmentally friendly community development	There is an element of goodwill and working relationship between the government and the communities. Various projects have demonstrated the willingness of communities to be involved- such as the Kitchen Gardens and other Ridge to Reef project activities. Recognition of community, NGOs and civil society participation and engagement through an award is yet to be realised.
	Accounting System	i. Set up a network with biodiversity agencies for recording revenue and expenditure on biodiversity related activities ii. Produce regular reports for each biodiversity project	Parts of these activities are covered through the oversight of projects by the Government (DICE). There needs to be a system in place to ensure that future projects understand and follow the procedure.
	Capacity Building	i. Capacity development needs to address biodiversity and conservation programs ii. Secure financial assistance to implement capacity development program iii. Develop capacity building program to improve financial management	Some level of capacity development has been undertaken, but these needs to be better coordinated so that future efforts are focussed on the needs of Nauru.
	Public Awareness	i. Publish and disseminate information on funding mechanisms	There is sufficient information available that could be used to fulfil this activity. Guidance should be provided through a request to regional partners to address this.

National Environment Management Strategy

The National Environment Management Strategy (NEMS) and associated Plan (National Environment Action Plan) was the first environment document that was developed and endorsed in the mid-1990s. It recognises the insurmountable challenges faced by Nauru, challenges that it will need to be overcome in order to achieve sustainable development. These challenges include:

- Land degradation, including severe degradation due to phosphate mining, coastal erosion and loss of soil.
- Inadequate environmental education, public awareness and training, including loss of traditional environmental knowledge and awareness, inadequate public environmental awareness, and inadequate environmental and science education.
- Inadequate environmental infrastructure and legislation, including the need for land tenure reform and the development of an environmental data base.
- Loss of biodiversity, including the loss of both species and ecosystem diversity and the loss of traditional varieties of important cultural plants.
- Coral reef and marine resource degradation and overexploitation, including the breakdown of traditional marine tenure and resource-use systems, the inability to optimally exploit pelagic and deep sea fisheries resources, and the breakdown of the traditional aquaculture system.
- Pest and disease infestations, including the need for the strengthening of quarantine procedures to ensure that serious new pests and diseases are not introduced into Nauru.

- Pollution and waste management, including the problems of solid waste management, water pollution, sewage treatment, air pollution and noise pollution.
- Population growth and urbanization.
- Health and nutritional deterioration.
- Economic vulnerability and instability.
- Inadequate development infrastructure and services.
- Global climate change, in particular the threats posed by sea-level rise due to global warming and increasing ultraviolet radiation due to the breakdown in the Earth's protective ozone layer.
- Radioactivity and nuclear pollution and their known detrimental effects on human health and the environment.
- International traffic in toxic and hazardous waste

The challenges identified some 25 years ago remain the same today, but in many circumstances these challenges have worsened. The lack of implementation, which may be attributed to limited human and financial resources, new and emerging issues that were not foreseen, and the deterioration in global affairs (in particular climate change and its impacts) continue to put pressure on Nauru and its people. Despite these, some actions have been taken with success noted (see Table 2).

Table 2. Nauru's NEMS Objectives and Programmes: Assessment of progress on implementation.

NEMS Objective	NEMS Programmes	Progress on implementation
1: Land rehabilitation and protection	1.1 Rehabilitation of the mined-out phosphate lands	• Rehabilitation work still on going • Land rehabilitation continues under NIEP Theme 2 – Land
	1.2 Rehabilitation trial	
	1.3 Soil manufacture	
	1.4 Erosion assessment and control	
2: Strengthening of environmental education	2.1 Development of a master environmental education plan (MEEP) and the establishment of an environmental education sub-committee (EES) and an environmental resource centre (ERC)	• Objectives continue under NIEP Theme 6 – Culture and Heritage; Theme 7 – Environmental Education, Awareness and Capacity Building
	2.2 Traditional environmental awareness campaign	
	2.3 "Keep Nauru a Pleasant Island competition	
	2.4 "Enviro-Media campaign	
	2.5 Pilot "Operation Clean-Up Nauru"	
	2.6 Upgrading science education	
	2.7 Tertiary training in environmental science and environmental management	
3: Strengthening environmental institutions and legislation	3.1 Establishment of a Nauru environmental coordinating committee (NECC)	• Continue in the NIEP Theme 1 - Environment Governance Environmental impact tools are supported and incorporated into Government planning. Land management reforms are being discussed by communities.
	3.2 Adoption of the environmental impact assessment process	
	3.3 Development of a land use planning system	
	3.4 Land tenure reform	
	3.5 Conduct of relevant environmental baseline studies	
	3.6 Establishment of a Nauru environmental information system	
	3.7 Review and enforcement of existing legislation	
	3.8 Enactment of new environmental legislation	
4: Conservation of biodiversity	4.1 Survey and selection of priority conservation areas 4.2 Establishment of pilot conservation areas under the SPBCP 4.3 Protection and rehabilitation of endangered plants and animals	Continue under NIEP Theme 2 – Land; Theme 3 – Resource Management and Biodiversity Conservation Conservation sites identified and recommended in the BIORAP

	4.4 Noddy bird population biology study and conservation initiative 4.5 Forestry and agroforestry development plan 4.6 Establishment of a nursery system for endangered and culturally-important plants 4.7 Establishment of a rehabilitation nursery	Noddy population surveyed and concerns raised due to their declining population and threat from over-exploitation. Nursery not yet established, although new Ridge to Reef project are promoting Kitchen Garden, providing planting materials to communities
5: Promotion of the sustainable use of marine resources	5.1 Establishment of marine reserves 5.2 Improvement of fisheries resources data base 5.3 Control of overexploitation of marine resources 5.4 Reinstitution of appropriate traditional marine resources management strategies 5.5 Rehabilitation of aquaculture in Buada lagoon 5.6 Improved exploitation of pelagic and deep-water fisheries resources	• NIEP Theme 3 – Resource Management & Biodiversity Conservation • A number of government legislation has been developed to assist with the management of the fisheries sector. This includes the Fisheries Act 19xx; NFMRA Act xx, Fisheries and the Coastal Fisheries and Aquaculture Bill 2017.
6: Pest and disease control	6.1 Establishment of an integrated pest and disease control program 6.2 Establishment of a quarantine service	• NIEP Theme 3 – Resource Management & Biodiversity Conservation
7: Pollution and waste management	7.1 Development of an integrated waste management plan and the establishment of a waste management authority 7.2 Waste reduction campaign 7.3 Education program for the safe handling and proper disposal of pesticides and chemicals 7.4 Strengthening of recycling capabilities 7.5 Green waste recycling 7.6 Establishment of a sewage treatment system 7.7 Composting toilet trial 7.8 Air pollution monitoring and control 7.9 Noise pollution control	• NIEP Theme 4 – Built Environment, Waste Management & Pollution Control • GEF 5 STAR – Nauru Ridge 2 Reef Project – one of the key focus is to reduce the use of plastic and to practice recycling. An additional focus is to no to littering and pollution in order to safeguard Nauru's environment.
8: Control of population and urbanization	8.1 Family planning program 8.2 Planned housing development 8.3 Immigration control	Immigration control in place. Housing development and family planning still work in progress
9: Health and nutrition improvement	9.1 Health and Nutrition Awareness and improvement campaign 9.2 Physical Fitness Campaign	Under the Ridge to Reef – nutritional awareness and improvement are being addressed through food security activities
10: Promotion of sustainable economic development	10.1 Strengthening of local production systems 10.2 Development of a tourism master plan 10.3 Promotion of ecotourism	Tourism is not yet a priority for the country, and a plan is yet to be developed.
11: Appropriate infrastructural development	11.1 Coordination of infrastructure and services planning 11.2 Consensus agreement on easement of right-of-way for essential services 11.3 Energy management plan 11.4 Integrated water conservation and supply management 11.5 Development of stormwater collection and disposal system for re-use	• NIEP Theme 4 – Built Environment • GEF-STAR 5 (Nauru Ridge 2 Reef Project) – water security through harvesting. 5 pilot districts trialled focusing on vulnerable households. Constructions of rain water tank and installations have reached a 97% target.
12: Addressing and preparation for global climate change and sea-level rise	12.1 Strong commitment to international initiatives addressing global climate change 12.2 Integrated coastal zone management and coastal protection 12.3 Coastal forest protection and reforestation 12.4 Protection from ultraviolet radiation	• NIEP Theme 5 – Climate Change Nauru remains committed alongside its Pacific neighbours towards address climate change impacts. Sea level rise and droughts are serious climate extremes that are affecting Nauru.
13: Maintenance of a strong anti-nuclear stance	13.1 Continued strong commitment to all international anti-nuclear initiatives 13.2 Nuclear awareness and education campaign	Nauru supports the regional stand to oppose nuclear activities in the region.
14: Maintenance of a strong stance against trade in toxic and hazardous wastes	14.1 Support of regional initiatives to ban the importation of hazardous and radioactive wastes	• NIEP Theme 4 – Built Environment, Waste Management & Pollution Control

National Integrated Environment Policy

The National Integrated Environment Policy (NIEP) is the most recent environmental strategy that updates and replaces the existing NEMS. The NIEP builds on 7 major thematic areas that are often used in assessing the state of environment process.

1. Environment Governance;
    a. Policy and legal framework
    b. Planning and enforcement processes for effective development control
    c. Monitoring and evaluation of environment policies and laws. Implementation and enforcement.
2. Land
    a. Integrated land use planning
    b. Sustainable land management
    c. Land rehabilitation
3. Resource management and biodiversity conservation;
    a. Inshore marine environment
    b. Invasive and threatened species management
    c. Protected areas
4. Built environment;
    a. Proper collection and management of solid waste
    b. Hazardous waste
    c. Freshwater resources, sewage and sanitation
5. Atmosphere and climate;
    a. Green house gas
    b. Ozone depleting substances
    c. Physical climate
    d. Climate change adaptation
6. Culture & heritage;
    a. Conservation of historical sites
    b. Traditional consumption and production of food and medicine
7. Environment education and capacity building
    a. Environmental education and awareness
    b. Building capacity

As this is a continuation of the previous NEMS and NEAP 1996, many of the activities are continuing. There is a need to track progress in a logical way so that outcomes can be measured and resources can be prioritised to address the gaps.

Section IV. Description of the national contribution to the achievement of each global Aichi Biodiversity Target

While Nauru is yet to develop targets that reflects the Aichi Biodiversity Targets, many of the activities identified in the various national documents (NBSAP, NEMS, NIEP, NSDS) are contributing towards the overall outcome. Some of these activities are captured in the following table (Table 3).

Table 3. Aichi Targets and National Contributions.

Aichi Targets	**National Contributions**
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	
 By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably	• Development of the National Integrated Environment Policy through national consultations with government agencies and community leaders. • National consultations on Sustainable Land Management under the Ridge to Reef Project. • Community consultations through the rapid biodiversity assessment, including direct participation of community members in undertaking biodiversity surveys and working alongside international scientific experts. • Developing a participatory 3-dimensional model combining aerial/satellite imagery and local traditional knowledge • Workshop held to raise awareness on the Inform Project – a project that build national capacity to implement multilateral environmental agreements by strengthening planning and the state of environmental assessment and reporting. • The Eben Omo campaign undertook a roadshow to 5 districts (Anabar, Anibare, Buada, Ijuw and Meneng) to focus on communities to plan more fruit trees and food crops, reduce waste and increase recycling, protect the marine environment, to reduce pollution and littering and to save and conserve water.
 By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	• National Integrated Environment Policy incorporating traditional knowledge and also the latest scientific findings from the rapid biodiversity assessment.
 By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	• The rehabilitation of mined areas continue to be the focus of the nation. The challenge remains in balancing development and taking care of the environment. • The secondary mining of existing mining sites, while providing the much needed revenue for the Government and communities, is hindering the process of rehabilitation and revegetation.
 By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption	• Sustainable production has not been promoted strongly in the past, due to a number of reasons such as limited natural resources available to communities. Recently, efforts to address this are gaining momentum, especially with the kitchen garden initiative under the Ridge to Reef program.

and have kept the impacts of use of natural resources well within safe ecological limits.	• Fishery resources, especially offshore fisheries, continue to be an important revenue earner for the country. Sustainable management of this transboundary resource relies heavily on the contributions of all parties (including distant fishing water nations) and good scientific data. Nauru is party to regional and international agreements to ensure sustainable harvesting of tuna resources. It has developed a number of national legislation to oversee the development, use and management of fisheries resources. Some of the legislation allows for the establishment of protected areas in the marine environment, as well as limited time and areas for exploitation.
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use	
 By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	• The legacy of phosphate mining over many decades means that most of the natural habitats of the island have been lost, including a big proportion of native forests. There is not much left to lose, but the rehabilitation efforts mean there is a lot to gain provided there is strong action and support at the grass root level. While the whole island needs help, the Topside (central plateau) and Buada lagoon are two significant sites that need to be prioritised for action. • The coral reefs are considered to be in good condition and among the best in the Pacific region. There is evidence of overfishing of some marine species and efforts to conserve them are in progress.
 By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	• Nauru has undertaken a thorough baseline survey of its marine resources and found some of the iconic giant clam species to be very rare. Efforts to safeguard these are now being explored including establishing conservation areas and developing species specific management plans. • The fish population is skewed towards more herbivorous species rather than predatory species, indicating a serious removal of the latter species. Groupers and snappers were particularly conspicuous by their absence or low numbers in many of the sites around the island. Reef sharks on the other hand are in good numbers. • Fish biomass was considered to be healthier in Nauru than many sites in the Pacific. • Fishing impacts on macro-invertebrates have caused a decline in their population and management of these resources is needed.
 By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	• Nauru does not have large plots of land dedicated to agriculture or aquaculture. Due to land tenure system, most of the agriculture plots are small and owned by families. There is effort under the current Ridge to Reef to encourage sustainable use of land resources for food security and production.
 By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	• Nauru has developed its solid waste management strategy and action plan. The focus of the strategy is on legislation, awareness, capacity building, waste disposal, waste reduction, reuse and recycling and sustainable financing. The goals are to reduce pollution from solid waste, increase economic benefits through recycling and reduce costs of managing waste. The GEF 5 STAR (Nauru's Ridge 2 Reef) project is assisting with the implementation of the waste management strategy.
 By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	• GEF-PAS IIB – Nauru has a strong biosecurity system in place to screen and manage threats at the border. • Identified the need to develop a specific invasive species strategy and plan in alignment with the NBSAP. • Develop and implement a national biosecurity programme to protect Nauru from the introduction of invasive plants and animals. • Take immediate action to eradicate and/or manage the yellow crazy ants (*A. gracilipes*).

 By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	• The President of Nauru, HE Baron Waqa called on world leaders to 'act now' at the 24th Conference of the Parties to the UN Framework Convention on Climate Change, in solidarity with the Pacific Island members that recognise the impact of climate change to vulnerable island ecosystems. •
Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	
 By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	• There is no gazetted protected area in Nauru. Considerable efforts in the past have focused on identifying areas and sites for conservation purposes (Govt. Nauru ND; GEF-PAS IIB project document; BIORAP), which also included on the ground scientific research providing baseline biodiversity information. Two sites of particular interest include the wetland area around Ijuw and Anabar districts. The complex land tenure system in Nauru, has been identified as challenge for the government in establishing protected areas. Consultations with communities (e.g. Ridge to Reef; BIORAP) have captured their interest in establishing conservation areas.
 By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	• The biodiversity baseline survey has provided Nauru with a clear picture of species that are vulnerable, or in need of conservation protection. Bird species are of particular concern, given their decline in nesting population and unsustainable harvesting for food. The same scenario is faced by many of the predatory fish species (groupers and snappers), where overharvesting has contributed to their low biomass. Management plans for these species are needed to ensure that their population is safeguarded and increased over time.
 By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	• Nauru recognises this as an important issue but due to limited resources and capacity, the issue is yet to be given the necessary support.
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services	
 By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	• Buada lagoon is an important ecosystem in Nauru and it needs investment to ensure that it is maintained in good and healthy condition. Our understanding of this site has improved considerably, and efforts to protect it continues under the Ridge to Reef program. • Nauru's unique tenure system means that all land and resources are owned by local communities. Any program or plans will need the consultation and approval by land holders.
 By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	• Rehabilitation of mined land is a priority of the Government, which includes revegetation and planting of indigenous trees. The conservation of areas remains an ongoing process between the Government and community leaders.
 By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from	• Nauru recognises the importance of the Protocol and current national efforts focus on raising awareness of the issue with communities and also building local capacity. In particular the "Prior informed consent" and the Mutually Agreed Terms" are key aspects that communities will be

their Utilization is in force and operational, consistent with national legislation.	interested in learning more of. Legislative framework is an important consideration and one of the areas that Nauru will explore and will be seeking assistance and support to implement.
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building	
 By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	• Nauru was one of the countries that endorsed its national biodiversity and strategic plan during the establishment of the Global Strategic Biodiversity Plan and the subsequent Aichi Biodiversity Targets. Much of the Nauru's NBSAP reflected the priorities raised by communities, civil society and government agencies. The implementation of the NBSAP has been *ad hoc* and resource dependent. There is an urgent need to review and revise the NBSAP to be in alignment with current global and regional targets.
 By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	• Nauru has always been a strong advocate for community ownership of its resources. This is reflected in some of its legislation. • There is a dawning reality that population increase and harvesting of resources are contributing to the decline in the overall condition of the environment. With ongoing mining operations, slow rehabilitation and recovery of mined areas, and climate variability, the outlook looks dire. Nauru needs support now more than ever to put in place practical frameworks that will help alleviate further degradation of the environment and safeguard the livelihood and wellbeing of its people.
 By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	• Workshop held to raise awareness on INFORM – a project that build national capacity to implement multilateral environmental agreements by strengthening planning and the state of environmental assessment and reporting. • Nauru capacity was built through a national training on Environmental Impact Assessment. This training was conducted in partnership with the Nauru Ridge to Reef Project, coordinated by the UNDP and DCIE. This training was in alignment with the NBSAP and NIEP. This has resulted in two EIA terms of reference for a proposed cemetery development and Nauru Port expansion.
 By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	• There has been an increase in project activities, and therefore funding support, for biodiversity activities in Nauru. These activities support the implementation the objectives of the NBSAP, as well as contributing to addressing other international agreements including Sustainable Development Goals.

Section V. Updated Biodiversity Country Profile

Biodiversity Status and Trends

Geological Settings

Nauru is surrounded by a fringing coral reef between 120 and 300 metres wide. The reef drops away sharply, at an angle of about 40°, to a depth of about 4000 metres. The island has a narrow coastal plain surrounding a limestone escarpment rising some 70 metres to a central plateau, known locally as Topside.

The coastal plain is comprised of sandy or rocky beach, a beach ridge, behind which are either relatively flat ground or, in some places, low-lying depressions or small lagoons filled by brackish water where the surface level is below the water table (freshwater lens). The most extensive system of these landlocked lagoons is found near the border of Ijuw and Anabar districts. Scattered limestone outcrops or pinnacles are found on both the coastal plain and on the intertidal flats of the fringing reef, with particularly good examples in the Anibare Bay area (See Figure 8).

Figure 10. Limestone pinnacles scattered along the intertidal reef flats near Anibare. (Image: PSkelton)

Topside, or the raised central plateau, consists of a matrix of coral-limestone pinnacles and limestone outcrops, between which lie extensive deposits of soil and high-grade tricalcic phosphate rock. This area covers about 16,000 hectares (over 70 % of the island) and has been mined for

phosphate for over a Century. Relative elevations on Topside vary generally between 20 and 45 metres above sea level, with occasional pinnacle outcrops reaching an elevation of 70 metres above sea level. The highest point on the island is Command Ridge in the west at an elevation of 71 metres above sea level. This is probably the original marking of the rim of the coral-limestone island. Traces of high ground (above 50 metres) across the centre of the island may mark the line of the former reef.

The results of gravity and magnetic surveys indicate that about 500 metres of dolomitised limestone caps the seamount. The limestone has been drilled to a depth of 55 metres below sea level and is intensely karstified (the formation of many cavities, sinkholes and cave systems due to the dissolution of limestone), with phosphate filling the cavities. A major karstic subsidence feature forms the catchment of Buada Lagoon. This is a landlocked, slightly brackish, freshwater lake, and its associated fertile depression (about 12 hectares in area), is located in the low-lying southwest-central portion of the island at an elevation of about 5 metres above sea level, and it may be the location of the former lagoon.

Soil Diversity

The Nauru soils are thinly layered and nutrient poor. The coastal soils are only about 25 cm deep, are coarse textured and contain more coral gravel than sand in the lower horizons. The plateau soils vary from shallow soils, (on the tops of limestone pinnacles composed primarily of organic material and sand or dolomite with very little phosphate), to deep phosphatic soils and sandy phosphatic rock up to over 2 metres deep between the pinnacles. Topsoils range from 10 to 30 cm in depth, overlaying a deeper subsoil which is frequently reddish yellow and between 25 and 75 cm deep, changing to pinkish grey at greater depth. Undisturbed plateau soils have a high level of organic material and are generally fertile.

Potassium levels are often extremely low, and pH values of up to 8.2 to 8.9 and high $CaCO_3$ levels make trace elements, particularly iron (Fe), manganese (Mn), copper (Cu) and zinc (Zn), unavailable to plants. Fertility is, therefore, highly dependent on organic matter for the concentration and recycling of plant nutrients, lowering soil pH, and for soil water retention in the excessively well-drained soils. Although levels of organic matter can be relatively high in undisturbed soils under natural vegetation, it can decrease dramatically as a result of clearance by fire or replacement by coconuts and other introduced plants (Morrison 1987, 1994).

Biodiversity Legislative Review

In 2018, SPREP and the Environmental Defenders Office Ltd (EDO, NSW) undertook a review of environmental legislation for Nauru. There is no overarching environmental or biodiversity legislation that covers natural resource management in the country. There are a number of legislations that covers specific aspects of resource management including the Wild Birds Preservation Act 1937, for the protection of Endangered Species. While some newer legislation reflects the priority of the Government (e.g. Nauru Fisheries and Marine Resources Authority Act 1997, Nauru Fisheries Act 1997, Fisheries Regulations 1998, and the Sea Boundaries Act 1997), others such as the Wild Birds Preservation Act are archaic and need to be amended. The latter legislation specifically mentioned bird species (magpies, snipe, quail and canaries) that are not found in Nauru.

Flora and vegetation

The vegetation and flora of Nauru although highly disturbed and outnumbered by introduced exotics (Fig. 11), still constitute a critical ecological and cultural resource for the people. This is particularly true for the indigenous species, virtually all of which had wide cultural utility within the traditional subsistence economy.

The most important ecological functions of Nauru's plant resources include the provision of shade to humans and animals, animal and plant habitats, protection from wind, erosion, flood and saltwater intrusion, land stabilization, protection from the desiccating effects of salt spray, soil improvement and mulching. These functions are critical to the sustainable habitation of Nauru.

The indigenous flora and vegetation of Nauru are limited. There are no endemic plants (unique to Nauru). The total number of vascular plants, including introduced species, amounts to over 500. The introduced species consist mainly of ornamentals, weed species, food plants, and a number of other useful cultivated plants. Because of the unique adaptability of indigenous Pacific Island plants to the harsh conditions of coastal and small-island environments, and their cultural and ecological utility, their protection and enhancement are crucial as a basis for sustainable development in Nauru.

Figure 11. Secondary forest dominated by introduced Adenanthera pavonine. (Image: PSkelton)

Seven plant communities are recognised in the most recent survey of the island (Whistler & Thaman, 2013): littoral strand, limestone forest and woodland, mangrove forest, freshwater marsh, managed land vegetation, secondary scrub, and secondary forest. Most of the island is covered in a secondary scrub community and very little native forest. The flora is relatively small and does not contain any unique species. A typical atoll in the region might have about 40 native plants, all of them littoral (restricted to areas near the seashore), but Nauru's larger number is indicative of its larger land area and higher elevation. This has allowed a few inland species to grow on the island. Some of the introduced species are invasive weeds, of which the red-bead tree's (*Adenanthera pavonine*), dominant in some areas and competes with native species.

Nauru's flora is made up of 63 indigenous species. Eight are widespread tropical ferns or pteridophytes, and among the flowering plants, there are seven monocotyledons and 48 dicotyledons (Table 4).

Table 4. Distribution of Nauru's flora by major plant groups. (source: Whistler & Thaman 2013).

Plant Group	Pre-1980		1980-90s		2007		Subtotal		Total Spp
	Indg	Intro	Indg	Intro	Indg	Intro	Indg	Intro	
Pteridophytes	2	-	7	3	6	2	8	4	12
Gymnosperms	-	-	-	2	-	5	-	5	5

Monocotyledons	3	3	6	136	7	84	7	164	171
Dicotyledons	28	37	43	291	40	225	48	337	385
TOTAL	33	40	56	422	53	316	63	510	573

Exotic (introduced) species, which constitute 89 per cent (510 out of a total of 573 reported species) of the flora of Nauru, dominate rural, household and urban vegetation, and include a wide range of ornamentals, weedy species, food plants and a number of other useful species.

Ornamentals, which are normally confined to house-yards and village gardens, comprise some 51 per cent (261) of the 510 exotic species. Weedy species make up 15 per cent (80 of 510 species), indicating both the poverty of the indigenous flora and the highly disturbed nature of the vegetation. Food plants represent 16 per cent of exotic flora, many of these species are restricted in numbers or utility, owing to the harsh environment, limited land area and limited focus on food production in Nauru. Other useful exotic species include kapok (*Ceiba pentandra*), cotton (*Gossypium barbadense*), tobacco (*Nicotiana tabacum*) and bamboo (*Bambusa vulgaris*), which were all reportedly more abundant in the past. Some larger weedy exotics, such as *Adenanthera pavonina*, *Annona* spp., *Casuarina equisetifolia*, *Lantana camara*, *Leucaena leucocephala*, *Mangifera indica*, *Muntingia calabura* and *Psidium guajava* have become naturalised and competitive with the indigenous species in some disturbed and relatively undisturbed sites.

Terrestrial invertebrates

Figure 12. Endemic insect. (image: PSkelton)

The indigenous character of Nauru fauna includes; a generally low number of terrestrial invertebrate species, a high proportion of Pacific wide and world-wide insects, and, a small proportion of island endemic insects and snails (Fig. 12). It reflects a geologically young, isolated and small land mass representative of Oceanic nations but distinct from Pacific Rim. A simplified invertebrate fauna of relatively low species richness occurs. Many components were dominated by introduced and often globally distributed species. Some indigenous species were recorded and species extinctions appeared likely. A high proportion of the native fauna is also native to the other islands of Micronesia and occurrs more widely on far flung island archipelago such as Marquesas islands or French Polynesia. A recent survey revealed new records of moths, land snails, ants and a possible endemic species (moth) (Edwards, 2013). A total of 51 moth species, 13 land snails (3 endemics, although 2 may be extinct), 6 dragonflies, and 17 ant species (all introduced including the yellow crazy ant – *Anoplolepis gracilipes*).

Reptiles

Figure 13. Oceania gecko, one of the native geckos found on Nauru. (Image: R. Stirnemann©)

The Pacific region has the highest proportion of threatened reptile species in the world (Bohm et al. 2013). Knowledge of reptile diversity in the Pacific is lacking due to vastness of the region and the fact that much of the diversity resides on small isolated islands, like Nauru. Knowledge on Nauru's reptiles was enhanced through a survey undertaken in 2012, where previous information was updated and validated (Fig. 13; Table 5; Backlin et al. 2013). One of the discoveries was a new species of skink that had been misidentified since the early 1950s (Brown & Marshall 1953). The presence of two widespread invasive species – Common House Gecko and the Brahminy Blindsnake is a concern, as is the threat from the invasive yellow crazy ant that has been reported elsewhere on the island (Wetterer 2005). The reptile population appears to be relatively intact, despite major disturbance to their environment and habitat. The population was higher in areas that have been left to revegetate for more than 15 years. Protection of these areas, which includes diverse habitats, will contribute to the conservation and protection of Nauru's unique reptile community.

Table 5. Reptiles captured during the latest biodiversity assessment. (Source: Backlin et al. 2013).

Scientific Name	Common Name	Total Captures
Emoia cyanura	White-bellied Copper-striped skink	193
Emoia sp.	Undescribed Skink	13
Gehyra insulensis	Stumped-toed Gecko	11
Gehyra oceanica	Oceania Gecko	15
Heidactylus frenatus	Common House Gecko	30
Lepidodactylus lugubris	Mourning Gecko	23
Ramphtyphlops braminus	Brahminy Blindsnake	5
Total Reptile Captured		290

Birds

Nauru contains a moderate number of bird species, which are important to the biodiversity of the island, as well as key to the cultural wellbeing of the people. A total of 36 bird species are recorded from the island (Stirnemann, 2013). Nauru has been an important nesting area for seabird populations, as evident by its guano history. Only one endemic bird species, the Nauru Reed Warbler (known locally as *Itsirir*) (*Acrocephalus rehsei*), is common over most of the island except for recently mined areas (Table 6). The Micronesian pigeon (*Ducula oceanica*) exists on Nauru in very small numbers, probably a population of 50-150 birds (Table 7).

Table 6. Nauru reed warbler distribution. (Source: Stirnemann, 2013)

	Site 1. (old mined pinnacle area)	Site 2: newly mined pinnacle area	Site 3: Forested site
No. of sites surveyed	16	15	27
Average number	0.87	0.13	3
Standard Deviation	0.84	0.29	1.98
Percentage of point counts with birds present	69%	20%	93%

Table 7. Micronesian pigeon distribution (source: Stirnemann 2013).

	Site 1. (old mined pinnacle area)	Site 2: newly mined pinnacle area	Site 3: Forested site
No. of sites surveyed	16	15	27
Average number	0.75	0	0
Standard Deviation	0.81	0	0
Percentage of point counts with birds present	44%	0%	0%

Two introduced bird species were recorded including the feral pigeon, that was introduced as pets but they are now wild, and the domestic fowl. These introduced birds are common around areas where people live.

Surveys of the black noddy (*Anous minutus*) and brown noddy (*A. stolidus*) indicate that they are being harvested faster than they can breed. The harvesting of seabirds is a serious concern, with well over 300,000 black noddy taken annually, according to Stirnemann (2013). Frigate birds (*Fregata minor* and *F. ariel*) are captured and tamed for traditional sport (Fig. 14). Approximately, 310 frigate birds are captured yearly, and a big proportion (120-150 birds) die during their capture (Stirnemann 2013). Seabird population have declined in Nauru, and the most impacted are Frigate birds, black and brown noddies and the bristle-thighed curlew. Threats caused by invasive species, loss of nesting sites, nesting site disturbance and unsustainable harvesting for sport and food are contributing to this decline.

Figure 14. A frigate bird tethered and being tamed. (Image: PSkelton)

Coral Reefs

Previous reports found Nauru's reefs to be in poor condition and of low diversity (King 1992; Jacob, 2000; Lovell et al. 2004; Chin et al. 2011). Lovell et al. (2004) reported the reef development to be poor, and coral communities to be either sparse or to contain mostly dead corals, especially near populated and developed areas. Recent reports by Chin et al. (2011) and Fenner (2013) have noted a healthy live coral cover 44-78% and in good condition. Fenner (2013) recorded 51 species of hard coral, although he estimated that Nauru reefs may contain over 100 hard coral species. This diversity

is considerably lower than nearby archipelagos (Fig. 15). Species belonging to the genus Pavona dominated the coral reef diversity, followed by Montipora, Porites and Acropora. Acropora was said to be common in the past, but possibly infestation by crown-of-thorns starfish and coral bleaching may have contributed to their decline. Four coral species found in Nauru are of interest globally due to their vulnerability to extinction (Table 8), and many are considered rare and in need of protection.

Table 8. Coral species of interest from Nauru. (Source: Fenner, 2013)

Species	IUCN Red List Category
Pocillopora fungiformis	Endangered
Montipora caliculata	Vulnerable
Heliopora coerulea	Vulnerable
Pavona venosa	Vulnerable

One coral species *Pocillopora fungiformis*, is only known from Madagascar. This species is listed as Endangered (IUCN) and as one of the top 50 Evolutionarily Distinct & Globally Endangered (EDGE) coral species in the world (Fenner, 2013).

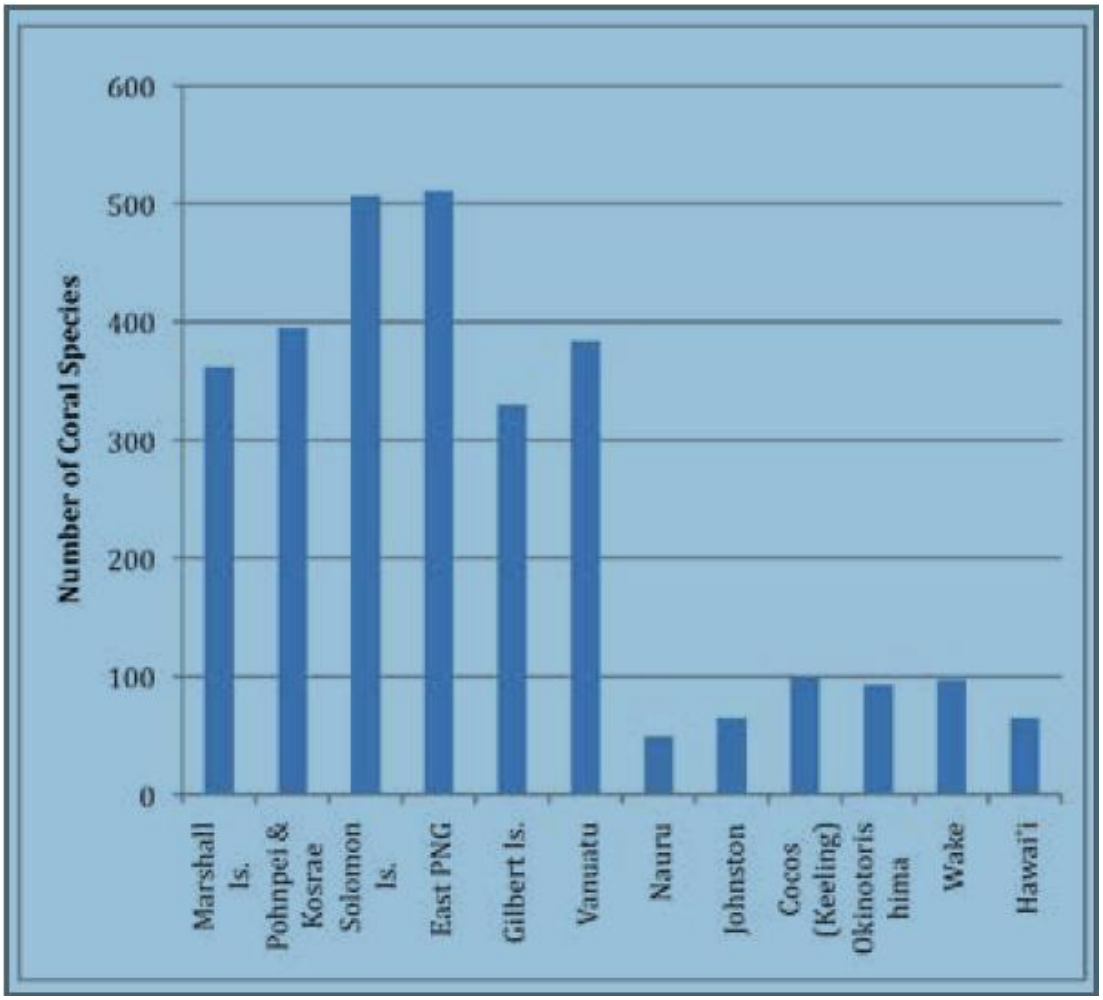

Figure 15. Total number of coral species known from Nauru and surrounding archipelagos (source: Fenner 2013).

Reef flats

Figure 16. Reef flat during low tide. (Image: PSkelton)

A rapid assessment of the intertidal flats of all of Nauru with a specific emphasis on the marine flora was completed as part of the rapid biodiversity assessment carried out in 2012 (Skelton, 2013). The intertidal reef flat was fairly narrow with the widest margin at approximately (300 m) from the high-intertidal water mark to the reef crest. There is no deep lagoon but a number of channels and reef crevices are found scattered throughout the reef flat. Most of the reef flat is exposed during low-tides with a few shallow tidal pools (Fig. 16). The short distance between the shoreline and the reef-crest ensures frequent daily flushing of the reef flats. Marine plants (mangroves and seagrasses) are absent from the coastal areas, with only a few plants of *Rhizophora* reported in land-locked ponds in the district of Anabar. Dominant organisms on the reef flats are algae comprising of the four major algal groups: Chlorophyta, Ochrophyta, Rhodophyta and Cyanophyta. In many parts of the reef flat clear zones can be seen with brown algae (Ochrophyta – mostly *Padina* sp.) dominating the high-intertidal area, green algae (Chlorophyta – comprising mostly of *Boergesenia forbesii, Microdictyon sp., Boodlea* sp.) dominated the mid-intertidal, and the red turf algae (Rhodophyta – *Ceramium* spp., *Polysiphonia* spp.) common in the low-intertidal to the reef crest area. The reef crest saw a mixture of red and green algae (*Dictyosphaeria cavernosa and D. versluysii*). Twenty new algal records for the island were found bringing the total number to 58 species. Introduced marine species associated with the fouling of wharves and ports were common including the bearded fire-worm (*Hermodice carunculata*) which has venom in its bristles that can cause a burning sensation (Fig. 17). Fouling organisms, turf algae and hydroids, which are often associated with wharves, ports and pilings were found to be common throughout the reef flats. The marine flora was found to be typical of new habitats with many turf algae supporting the high number of grazers on the reef flat.

Figure 17. Hermodice carunculata found in shallow intertidal pools. (Image: PSkelton)

Marine invertebrates

Figure 18. Actinopyga mauratania – a common invertebrate in intertidal pools. (Image: PSkelton)

The reefs of Nauru have a relatively low number of marine invertebrates, with about 79 recorded, representing 43 families. The invertebrate fauna is dominated by sea urchins (Diadematidae), molluscs (Muricidae), sea cucumbers (Holothuridae – Fig. 18) and crabs (Trapeziidae). Two species of giant clams are also recorded, although believed to be very rare (van Dijken, 2013).

Fish

Nauru's reef fish fauna is comprised of about 407 species. The reef fish fauna is dominated by Labridae (34 spp), Pomacentridae (30 species), Acanthuridae (21 spp), Chaetodontidae (21 spp), Balistidae (12 spp), Serranidae (11 spp) and Scaridae (10 spp) (Feary, 2013). Although the abundance of the reef fish fauna is high relative to other nations, there are significant signs of overfishing. In a fish survey undertaken in 2012, several usually common groups of fish were under-represented, and the overall fish community structure was unbalanced with a high proportion of herbivorous species and a very low proportion of predators (Feary, 2013). The survey noted a lack of large sized fishes like groupers and snappers. Whitetip reef sharks (*Triaenodon obesus*) are in good numbers.

Nauru is known to be a range state for at least 7 migratory species listed for protection under the CMS Appendices (e.g. whale shark, blue whale, humpback whale). The total Exclusive Economic Zone was known for its abundant tuna stocks, especially skipjack and yellowfin and, to a lesser degree, bigeye. However, tuna stocks are heavily influenced by the El Niño Southern Oscillation events, with more during El Niño periods and less during La Niña periods.

Coastal Fisheries

Nauru's artisanal fleet comprises of small (less than 6 metres) powered skiffs and canoes operated by resident fishers. The powered crafts are used for trolling and often target pelagic species. Other types of fishing include dropline fishing, gillnetting, cast-netting, angling, spearfishing by free diving or with scuba and reef gleaning targeting reef fish and invertebrates, which are mainly used for subsistence. Some commercial fishing activities are practiced but mostly on a part-time scale (99% of fishers), meaning that fish catches are sold only when there is surplus after meeting the subsistence needs. Apart from trolling and deep bottom dropline fishing, the coastal fishing activities are generally conducted on the reef flats and the reef slopes (NFMRA, 2015).

Table 9. Annual fisheries and aquaculture harvest in Nauru, 2014. (Source: Gillett, 2016)

Harvest Sector	Volume (mt)	Value (A$)
Coastal commercial	163	1,306,955
Coastal subsistence	210	1,177,834
Offshore locally-based	0	0

Offshore foreign-based	177,315	282,100,000
Freshwater	0	0
Aquaculture	0	0
Total	177,688	284,584,789

The economic crisis faced by Nauru since the turn of the Century has seen a rise in fishing activities, especially reef gleaning and collecting (CoFish, 2005). Dame (2006) gives some insight into another changing aspect of fisheries employment in Nauru. Fishing activity among the people is likely to increase following the repatriation of I-Kiribati and Tuvaluan expatriate workers. Previously, following the winding down of mining operations, most fishing activity was carried out by I-Kiribati and Tuvaluan nationals. Nauruans and other nationals, tend to buy fish from the I-Kiribati and Tuvalu anglers and garden fresh produce from the Chinese. The repatriation of I-Kiribati and Tuvaluan workers and with increasing numbers of Chinese nationals also leaving the island, is encouraging Nauruans to go out and gather the supplies themselves.

Pressures and Drivers of change to biodiversity

(direct and indirect)

The major drivers that influenced biodiversity in Nauru are Population Growth, Climate Change and Variability including Natural Disasters, Unsustainable Economic Development and Traditional and Contemporary values (attitudes and lifestyles). These drivers have been highlighted in previous government reports and continue to be a major priority for the Government and the people.

Population Growth

The most recent census for Nauru found a population of 10,084 ;(Govt. Nauru 2011; Fig. 19), with projection to reach 11,288 by 2015 (www.nauru.prism.spc.int).

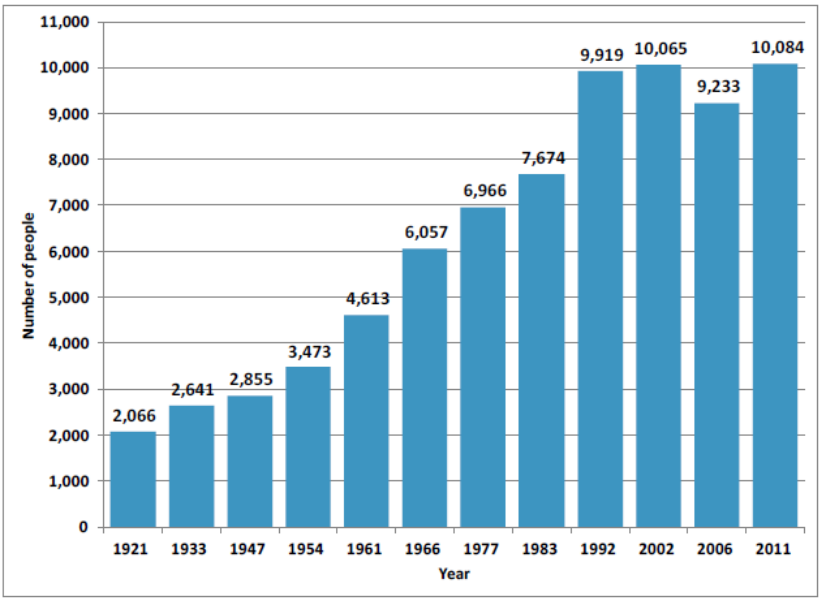

Figure 19. Total population of Nauru from 1921 to 2011. (Source: RON – Census 2011).

The population density of Nauru was 478 people/km^2, making in the densest in the Pacific Islands, and which is considerably higher than most countries (Fig. 20) (Govt. Nauru Census 2011).

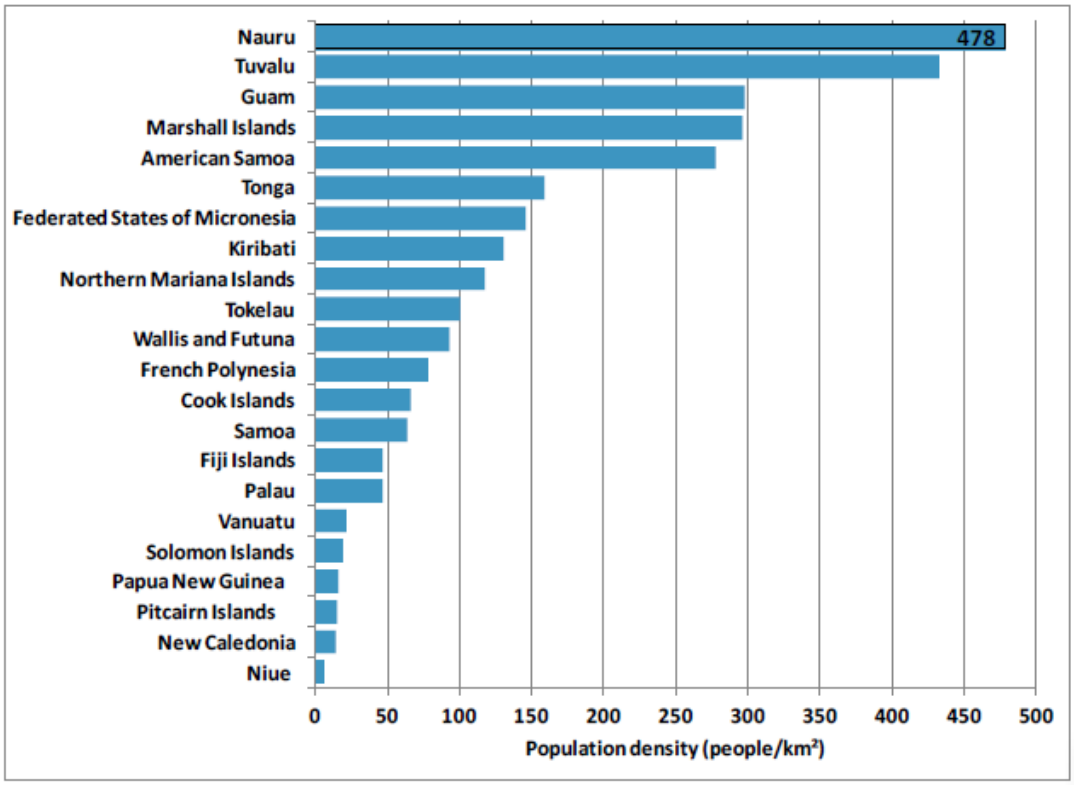

Figure 20. Population density (number of people/km2) showing Nauru to be most populated. (Source: RON - Census 2011)

The high population density and growth puts pressure on the country's natural resources. This will hinder rehabilitation efforts, as land is cleared for housing and other infrastructure developments. With the limited land availability, there will be a continuous reliance for the importation of goods to meet the population needs. There is also a concern about the urbanisation of parts of the country.

Economic Development (Phosphate Mining)

Phosphate mining has done irreparable harm to the island's ecological systems, more so than any other nation in the Pacific. The mining cleared much of the natural vegetation and forest, especially in the high fertile areas of the central plateau. Of the 37 hectares of the *Callophyllum* forest that was recorded in 1994 in the central plateau, most are now lost due to mining (NBSAP 2013). Along with the loss of vegetation, are the critical habitats that supported animals and plants. Some plant species are now gone – extinct or extirpated (NBSAP 2013; Whistler & Thaman 2013), and seabird populations have seriously declined over the years (Stirnemann 2013). The mined land needs a lot of work in order to make this suitable for growing food for people's security. The fishery resources are the only other major economic revenue for the Government. Fisheries are under enormous pressure from being over-fished, and the transboundary nature of pelagic resources make it a highly volatile revenue for the Government.

Climate Change (Sea-level Rise; Drought; Water; infrastructure)

Nauru's geological location makes it susceptible to risks associated with climate variability and natural disasters. The country has experienced serious droughts, with significant impacts on 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. 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 (Republic of Nauru, 2015).

Unsustainable Harvesting of Natural Resources

The decline in natural resources and biodiversity is not only attributed to the destruction of ecosystems but the overharvesting of birds and marine resources. The harvesting of black noddys is done at a rate that is unsustainable, and similar observations are seen in other seabirds such as the frigate birds. With the marine resources, there is clear evidence that snappers and groupers are missing from the food chain, which means they are being severely targeted. This will cause an unbalance in the ecosystems, leading to heavy grazing by herbivorous fishes. The use of overly efficient equipment, such as SCUBA for spearing fishes, and gillnets with fine mesh size are adding to the pressure of marine resource decline.

Invasive Species

Invasive species are a serious problem for island ecosystems, and Nauru is particularly vulnerable because of its compromised ecological system. The flora of Nauru is comprised of mostly introduced plants, and some of these are causing ecological harm by outcompeting native plants. Mammals,

such as cats and rodents are also a risk for the fauna, in particular reptiles and birds. While the recent rapid biodiversity assessment found rats and cats to be present, their impacts to the reptile and bird populations were not to the same scale as that caused by habitat destruction. Nevertheless, the impact of these invasive animals to the health of the people and their pets are yet to be determined but it is likely to be problematic. The presence of the invasive yellow crazy ants is a threat to the wellbeing of the people, as well as other insects, reptiles and birds. There is a strong and urgent need to boost the biosecurity of the island to prevent further introductions and incursions.

Waste Management

Waste management is a challenging issue in small island countries, and Nauru's situation is no different. There is only one waste management site on the island covering approximately 5 ha. There is concern about leachate and stormwater runoff. The majority of waste is plastic bottles and plastic bags, with tins, cans, nappies and broken glasses being very common. Waste sites are a magnet to many invasive rodents, feral cats, dogs and pigs, hence there is a need to manage this site. Of concern to the environment is the harm caused by many of the wastes, especially plastic waste. Nauru has developed its waste management strategy, which needs to be implemented and supported. The currently implemented GEF 5 STAR Ridge to Reef project is undertaken actions to assist with the implementation of the waste management strategy.

Measures to enhance implementation of the Convention

Implementation of the NBSAP

Note that implementation remains a challenge due to a range of reasons. This includes capacity, funding and establishing of national frameworks. Conflicting priorities of the Government have a bearing on the implementation of the work.

Actions taken to achieve the 2020 ABTs

Nauru recognises the importance of the ABTs and the need to put in place national mechanisms and support structures to achieve sustainable outcomes. There are national challenges that are hindering progress, and therefore the successful realisation of national priorities. These same challenges are burdening efforts towards fulfilling the national commitment to international agreements. There is, however, a strong commitment by the Government and its citizens to improve their well-being, environment and economic aspirations for the benefit of all Nauruans.

Raising awareness on environmental challenges, building the capacity of communities and developing policies and strategies are some of the efforts taken by the Government, as part of its contributions towards the global biodiversity strategy and ABTs.

The challenges have been the lack of, or limited resources (both human and financial) towards the implementation of strategies and supporting community level initiatives. This has been compounded by complex land tenure systems when it comes to establishing conservation areas, and putting in place effective resource management systems. The variability in weather and extreme climate change impacts have contributed to challenges such as beach erosion of the narrow coastal plain,

and the prolonged droughts (up to 3 years) have caused water shortages and stress to species and ecosystems.

The Government is working in partnership with regional and international organisations is helping communities to understand their environment, their biodiversity and the critical functions of the ecosystems. The Government's capacity is built, enhanced and mentored so they are able to carry out their roles and contribute to a prosperous Nauru. Government management systems are still a work in progress and the focus should support the efficiency and the security of these systems, to benefit Nauruans now and in the future.

Support mechanisms for national implementation (e.g. funding, capacity building, coordination, mainstreaming)

Nauru has and continues to benefit from a number of good projects that support the active participation of communities. Many of these projects provide baseline information on Nauru's situation, build the capacity of agencies and community members, raise awareness of Nauru citizens, formulate policies, strategies, programmes and plans, and provide much needed financial support. Some of these projects include:

- GEF-PAS IIB
- GEF-PAS Invasive Species
- GEF Ridge to Reef

The Government has established a number of multi-disciplinary working committees, as a means to overcome the silo approach that has been a norm for many years.

Mechanisms for monitoring and reviewing implementation

While monitoring and evaluation are key components of the NSDS and NBSAP, there is no national system in place to carry out these processes. Evaluation on the implementation of national policies is often undertaken only when timeline for these policies is up and a new strategy needs to be developed. There is an urgent need for support in this area, which could be catered for under existing partnership arrangements, for example with the Inform project being implemented by SPREP and its member countries.

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