APPENDIX A

Strategic & sectoral documents for infrastructure planning and programming

Several documents provide insight into the future demand for public infrastructure and services: the Nauru Sustainable Development Strategy (NSDS), a road map on energy, and sectoral elaborated strategies and plans in water and sanitation, solid waste, education, and health. These document are briefly summarized from the perspective of future public infrastructure and related public services needs from the perspective of the GON, ministries and agencies overseeing the sectors, and the general public.

1. Nauru Sustainable Development Strategy goals, outcomes and milestones

The NSDS is the main reference document to identify objectives and targets for important development sectors in Nauru. All ministries and sectors contribute to the NSDS as a basis for a national consensus for action. The NSDS was first approved in 2005 to cover the period 2005–2025; it was revised and updated in 2009; and further revised in 2017 to 2019 to cover the period 2019–2030 with a milestone review around 2022.

Table A-1 is an overview of the main goals, outcomes, and milestones of the NSDS 2019, which refer to demand for public infrastructure. The NSDS has few quantitative targets, especially for infrastructure. This omission makes it difficult to identify gaps in the infrastructure and services availability compared to NSDS goals. Targeted qualitative and quantitative outcomes should be a key driver for planning and programming of renewal, upgrading, or new public infrastructure for annual investment under the government budget or from support of international development partners.

Table A-1: Nauru Sustainable Development Strategy 2019 Goals, outcomes, and milestones

Sector	NSDS 2019–2030	Comments including gaps as per 2019
Infrastructure sector		
Goal	Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	New Infrastructure Ministry established in 2018
Economic sectors		
Water & sanitation		
Goal	Goal 6. Ensure availability and sustainable management of water and sanitation for all	
Outcome	Key Outcome 16: Provide a reliable, safe, affordable, secure and sustainable water supply to meet socio-economic development needs • Proportion of population accessing regular and safe drinking water and improved sanitation facility to increase • Proportion of rain and ground water harvesting to total water production to increase • Potable water available daily to each person on Nauru to increase.	Good NUC management and technical capacity to manage RO water production and distribution by trucks No management nor monitoring of water resources

Sector	NSDS 2019–2030	Comments including gaps as per 2019
Milestones 2022	By 2022, achieve universal and equitable access to safe and affordable drinking water for all (SDG 6.1) • Reticulated water supplies to cover the entire island by 2022. Commence introduction of piped water systems in Aiwo and Meneng • Increased number of water tanks and increased average tank storage capacity • Maintenance of water quality • Elimination of water losses	Currently no reticulation of water supplies existing Piped water system in Aiwo between NUC and Hospital under consideration
Sewerage & Solid Waste		
Outcome	Key Outcome 17. Effective management of waste and pollution that minimizes negative impacts on public health and environment • Proportion of waste effectively and sustainably managed to increase • Number of national and sector policies, plans and programs in which waste and pollution issues have been integrated to increase	Fragmented responsibility for collection and disposal Incomplete monitoring of waste disposed
Milestones 2020– 2023	• 30% reduction in solid waste disposal by 2020 over 2017 volume • 75% reduction in bulky waste stockpiles by 2020 over 2017 levels • More than 15% of waste management budget self-generated by 2020 and 30% by 2023	Simple pilot hand sorting system being tested Unmet demand for solid waste monitoring, sorting and disposal equipment
Energy		
Goal	Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all	
Outcome	Key Outcome 15. Energy: Provide a reliable, affordable, secure and sustainable energy supply to meet socio-economic development needs • Proportion of renewable and alternative energy to total energy production to increase • Cost of total fuel consumption to decline • Number and duration of power supply disruptions to decline	Good NUC management and technical capacity to rehabilitate power generation system, stabilize grid and avoid disruption
Milestones 2020-2022	• Reduce system/line losses in distribution system to target areas from 26% in 2017 to below 5% in 2022 • NUC income sufficient to meet all costs including operational and capital costs by 2021. • % share of renewable to total energy increased from 3.49% in 2017 to 50% in 2020. (SDG 7.2)	1 solar PV projects 1.1 MW under implementation 1 solar PV plus storage for 6.5 MW under preparation
Transport		
Outcome	Key Outcome 18.: Improve transport infrastructure and provide reliable and affordable public transport service • Public transport vehicles per capita to increase • Value of Public expenditure on roads to increase • Frequency of international air and sea links to increase	Strategy of purchase 2 new public buses every year under implementation Emerging demand for road and runway resurfacing and extension

Sector	NSDS 2019–2030	Comments including gaps as per 2019
ICT		
Outcome	Key Outcome 19. Communications and Media: Provide universal and reliable access to internationally competitive communication services and an independent and commercially viable media • Cellular subscribers per 100 population to increase • Internet users per 100 population to increase • Proportion of local content on TV to increase • Copies of local newspapers sold in a week to increase	Internet undersea cable project between Nauru and Guam under implementation Inshore internet cabling under development
Fisheries		
Goal	Goal 14. Conserve and sustainably use the oceans, seas and marine	
Outcome	Key Outcome 3.: Enhance development and sustainable management of marine and fisheries resources to provide sustainable economic returns • Increase contribution of fisheries to GDP • Increase the value of fishing licenses and access fees • Maintain the proportion of fish stocks within safe biological limits during medium term period	Limited current monitoring of marine resources Fishing licenses and fishing days approaching sustainable maximal limits
NRC		
Outcome	Key Outcome 4. Mining and Quarrying: Efficient and effective use of mining and quarrying resources • Value of phosphate exports to be maintained • Value of other mining and quarrying exports to be maintained • Hectares of land rehabilitated to increase	Very low acreage of land rehabilitation due to lack of heavy equipment
Environment, CC & DRM		
	Key Outcome 24: Build up resilience to combat the effects of climate change and natural disasters • Water sector resilience to drought to increase • Capacity building in climate change adaptation to forestall health related issues to increase • Production of drought tolerant fruit trees to increase • Baseline studies and assessments of climate change impacts on coral reefs, fisheries and marine resources to be completed and implemented • Integrated coastal zone management and coastal protection plan to be completed and implemented • Disaster management system to be implemented • Early warning system through a national centre for drought monitoring, meteorological and hydrological services to be implemented • National adaptation fund to be created • Climate change to be mainstreamed into national development policies and plans.	Absence of comprehensive Integrated coastal zone management and coastal protection plan Slow progress of seawall protection by NRC Early warning system national centre under development under NES responsibility
Social Sectors		
Health		

Sector	NSDS 2019–2030	Comments including gaps as per 2019
Goal	Goal 3. Ensure healthy lives and promote well-being for all of all ages	
Outcome	Key Outcomes 9: • Total health expenditure as a % of total government expenditure to increase • Under five mortalities (DHS – 44/1000), Infant mortality rate (DHS – 38/1000) to decline • Maternal mortality rate, Unmet need for family planning (DHS – 23.5%) to decline • Contraceptive Prevalence Rate to increase • Age Fertility Rate (15-19 yrs) (DHS – 15%) to decline • Deliveries by skilled birth attendant (DHS - 97.4%) to increase • Women who had high risk sex in the past 12 months (DHS 23.9%) to decline • Men who had high risk sex in the past 12 months (DHS 51.5%) to decline • Percentage of population suffering from diabetes to decline • Percentage of population at risk of developing NCDs to decline • Prevalence of NCDs to decline • Life expectancy to increase	New hospital phase 1 and phase 2 recently completed and equipped with modern capability Poor building and equipment available for diabetes and NCD disease management and control Unmet demand for nursing homes and modern paediatric facilities
Sport		
Outcome	Key Outcome 10: • Enhanced quality of life through Sports for All • No. of medals won in regional and international sports competitions to increase • No. of scholarships/training awards provided to elite sports people to increase • Per cent reduction in NCD cases reported per year • Per cent reduction in deaths caused by NCD per year	Indoor sport hall completed Unmet demand for improved outdoor sport facilities
Education		
Goal	Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	
Outcome	Key Outcome 8: • Improve the quality and broaden the scope and reach of education • Net enrolment ratio in primary education to increase • Proportion of pupils starting grade 1 who reach last grade of primary schooling to increase • Literacy rate of Year 12 students to increase • Student attendance rates to be raised • Proportion of special needs students attending Able Disable Centre to increase • Percentage of teachers with a diploma or degree to increase • Proportion of youth population undertaking either academic or TVET courses to increase • Pass rates for access to regional tertiary study opportunities to increase • Number of people with disabilities in employment to increase • The government shall put in place a dynamic policy approach to achieve the NSDS vision.	Demand for classroom inadequate to serve planned increase of school attendance Good management of the TVET facilities Unmet demand for further TVET facilities and equipment
Milestones 2021	• Student attendance increased from 40% in 2017 to 60% by 2021 • Acquired resources, equipment and materials; completed IT connectivity and buildings by 2021	Unmet demand of IT and other equipment in schools

2. Sectoral strategies and plans

Another source of information for guidance on public infrastructure and service demand and gaps are sectoral strategies. Table A-2 summarizes recent sectoral strategies and other studies developed for Nauru; however, some of these studies are old and outdated.

Table A-2: Infrastructure sectors strategies and studies available

Sector	Sectoral Strategy / Plan/ Study Available
Aviation	Observation of Nauru's Roads, Runway and Taxiway Areas 2016
Land	Observation of Nauru's Roads, Runway and Taxiway Areas 2016
Maritime	IBRD, Pacific Islands Supporting Safe, Efficient and Sustainable Maritime Transport Systems Improving Ports and Maritime Shipping (2015) ADB, Nauru Port Pre-Feasibility Study Final Report, 2015
Energy	Nauru Energy Road Map 2014 – 2020
Electricity & Water supply	NUC Strategic Plan 2015 to 2020
Fuel Tank Farm	Nauru Fuel Terminal 2018 Engineering Review
Water Resources	AUS-DFAT Groundwater Investigation Details Study 2001 SOPAC National Integrated Water Resource Management Diagnostic Report for Nauru 2007 SOPAC Assessing the vulnerability of shallow groundwater domestic wells in Nauru 2010
Water & Sanitation	Project formation study Nauru water supply improvement study 2010 National Water, Sanitation and Hygiene Implementation Plan 2012 Nauru Water Supply and Sanitation Master Plan 2015-2035 Nauru Priority Water Sector Development and Funding Needs Report 2017
Solid Waste	National Solid Waste Management Strategy 2017-2026
ICT	Nauru Telecommunications Sector Plan and Review March 2009
Fisheries	None
Education	Footpath IV, Education Strategic Plan 2017-2021
Health	National Health Strategic Plan 2016-2020
Environment	Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt) 2015

The following paragraphs summarize main objectives and targets documented in sectoral strategies that were current in 2018 up to 2020.

2.1 Nauru Energy Road Map 2014–2020

The Nauru Energy Road Map 2014–2020 has the following objectives:

- **Diesel power capacity:** The electricity demand forecast projects a maximum demand increase from 4.49 MW to 12.85 MW in 2020. The generation strategy required the installation of sufficient diesel generation capacity to meet the maximum demand with an N-2 security requirement. The security criteria for generating capacity on the system is N-2. That is there should be sufficient capacity available to supply the maximum demand of the system with the loss of the two largest generators.
- **Renewable Electricity Strategy:** The renewable power generation strategy adopts the government target of 50% of energy from renewable sources by 2020.
- **Distribution Network Strategy:** The energy loss is projected to be reduced from 41% to 8% by 2020. To improve reliability of supply and minimize the frequency and duration of power outage by (i) improving standards of construction and maintenance to minimize the risk of faults; and (ii) reducing outage times by improving response to system events when faults do occur.

2.2 National Water, Sanitation and Hygiene Implementation Plan (NWSHIP) 2011–2026

The National Water, Sanitation and Hygiene Implementation Plan 2011–2026 was submitted to the Government of Nauru, but is unclear if it has been officially approved. It has the following goals and objectives relevant for infrastructure planning and programming:

Policy goal 1: Climate variability and change incorporated in all aspects of water and sanitation management.

Policy Objective	Advancement to date
1.1 Nauru rainfall data collected, stored, analysed systematically and reported monthly	Not advanced
1.2 Early warning system for extreme seasonal climate events relevant to water supply developed.	Under implementation under NES
1.3 Drought management strategy developed, endorsed and operational.	Not advanced
1.4 Procedures reviewed for drought declarations and warnings modified where necessary	Not advanced
1.5 Heavy rainfall contingency plans developed and operational	Not advanced
1.6 Climate change adaptation action plans developed for water supply, demand, sanitation and hygiene	Document developed under CIE

Policy goal 2: Reliable, safe, affordable, secure, efficient and sustainable water supply established.

Policy Objective	Advancement to date
2.1 Water master plan for the long-term development of Nauru's water sources and associated storage and supply infrastructure produced	Developed and approved
2.2 Water quality standards established for Nauru and incorporated into water safety plans or water quality management plans	Marginally advanced by NUC
2.3 Sources of groundwater pollution identified, and plans developed to deal with them.	Not advanced
2.4 Stored and delivered RO water and public rainwater storages treated to standards	Well advanced for RO water; not advanced for rainwater
2.5 Guidelines for rainwater harvesting, storage and maintenance introduced	Not advanced
2.6 Rate of supply of fresh water increased	Well advanced and achieved by NUC
2.7 Unaccounted for water and water losses from RO system reduced to acceptable levels	Well advanced and achieved by NUC
2.8 Storage capacity for RO water and public rainwater systems increased.	Achieved for RO water; not advanced for rainwater
2.9 Delivery capacity of RO water improved	Well advanced and achieved by NUC
2.10 Delivery strategy for priority users such as the hospital, schools and community storages established	Advanced by CIE
2.11 Infrastructure maintenance, investment and replacement program established.	Developed by NUC
2.12 Alternate, low energy-consumption sources of water developed	Not advanced
2.13 Full assessment of groundwater resources completed including sustainable yield, quality and fit-for-purposes uses	Not advanced
2.14 Public and private water sources protected from misuse, pollution and theft.	Not advanced

Policy goal 3: Sanitation systems introduced which meet appropriate sanitation needs, minimize impacts on the environment and encourage improved hygiene.

Policy Objective	Advancement to date
3.1 Sewage sludge and outfall systems introduced which minimize environmental impacts	Not adopted; outdated solution
3.2 Sanitation systems and practices introduced to minimize groundwater pollution and health impacts	Not advanced except old studies
3.3 Training programs for maintenance of household sanitation systems introduced	Not advanced formally by CIE

Policy Objective	Advancement to date
3.4 Non-potable water used for toilet-flushing	Not advanced formally by CIE; adopted by some population

Policy goal 4: Equitable system for controlling demand, conserving water and minimizing waste and losses.

Policy Objective	Advancement to date
4.1 System created to determine, update and report on water demand by different sectors from all sources in wet and dry conditions.	Not advanced
4.2 Fair system developed to control demand for RO water and recover costs of water supply.	Advanced by NUC
4.3 Targets set for water use by sectors especially in droughts	Not advanced
4.4 Equitable system in place to optimize groundwater extraction to no more than the sustainable yield	Not advanced
4.5 System established to manage fair water distribution from community water tanks	Not advanced

Policy goal 5: Clear, consistent and transparent system of water and sanitation policy, plans and laws established identifying organizations, roles, responsibilities for managing, conserving and protecting water resources.

Policy Objective	Advancement to date
5.1 National water, sanitation and hygiene policy proclaimed by Cabinet	Not advanced
5.2 National 15-year IWRM water policy implementation plan adopted	Not advanced
5.3 Whole-of-Government – Community Nauru peak sector National Committee established under the National Development Committee	Not advanced
5.4 Whole-of-government Water Technical Committee (WTC) formally established	Not advanced
5.5 Water Unit (WU) created within the lead Ministry as the agency responsible for planning, managing, monitoring and reporting of Nauru's freshwater resources in collaboration with the Water Technical Committee	Not advanced
5.6 Review of all legislation, regulations and policy relevant to water and sanitation conducted to determine the need for water and sanitation legislation or regulations to manage, conserve and protect fresh water	Not advanced
5.7 Implementation of policy included in Departmental, Agency and Corporations' Operations Plans	Not advanced

Policy goal 6: Appropriate resources, capacity, skills training, information and organizations available for managing water and sanitation systems sustainably.

Policy Objective	Advancement to date
6.1 Water Unit operational and adequately resourced	Not advanced
6.2 Capabilities required for WU and WTC staff specified	Not advanced
6.3 Appropriate training programs identified	Not advanced
6.4 Coordinated water resources and sanitation monitoring and reporting system established	Not advanced
6.5 Centralized, accessible national water resources, sanitation and hygiene data bases established	Not advanced
6.6 System established for regularly informing the public on water resource issues	Not advanced

Policy goal 7: Community aware of the issues and actively engaged in planning, protection and conservation of water and improvements to household water and sanitation facilities. It has six objectives, related indicators and qualitative targets.

Policy Objective	Advancement to date
7.1 Community based organizations, industry, commerce and woman represented on peak National Water, Sanitation and Hygiene Committee	Not advanced
7.2 Water, sanitation and hygiene programs incorporated into school curricula at all levels	Marginally addressed
7.3 Local district water, hygiene and sanitation sub-committees established	Not advanced
7.4 Incentive programs created for improving and maintaining rainwater harvesting and storage at the household and business level.	Not advanced
7.5 Incentive programs introduced for moving to sanitation systems that minimize groundwater pollution and use of potable water for flushing	Not advanced
7.6 Public education, communication and engagement strategy to increase capacity, raise awareness and encourage participation in conserving water, protecting water sources and minimizing waste of water established	Not advanced

2.3 Nauru Water Supply and Sanitation Master Plan 2015–2035

The Nauru Water Supply and Sanitation Master Plan 2015–2035 covers both water supply and wastewater management with the following demand:

- **Water Supply Strategy:** The proposed water supply system is a traditional water supply system with pumping to key reservoir locations and then making maximum use of gravity to supply a ring main, which extends around the island. The water supply accommodates the use of conjunctive water sources to reduce Nauru's reliance on desalination, although reverse osmosis water will remain the primary bulk of water to

be centrally produced and distributed. Improvements in rainwater harvesting at a household level are possible and actively encouraged. A water demand of 130 litres/person/day has been adopted in the water demand forecasts. Average daily water demand in
2025 = 2,036 m^3/d with 8 days storage capacity on topside rehabilitated storage tanks.

- **Wastewater Strategy:** The proposed sewerage system advocates the use of a Common Effluent Disposal (sewerage) conveyance system, which retains septic tanks at a household level. A conventional sewage treatment process without high operating skills or advanced technology has been proposed. The sewage treatment plant is required to have the capacity to handle septic tank sludge and the proposed plant consists of anaerobic digestion, balancing tank, fine screening, trickling filter and a secondary settling tank.

2.4 National Solid Waste Management Strategy 2017–2026

The National Solid Waste Management Strategy 2017–2026 has the following goals:

- Goal 1: To reduce environmental pollution from the generation and disposal of solid waste.
- Goal 2: To increase economic benefits and efficiency by reusing and recycling wastes where possible.
- Goal 3: To reduce the costs to society of managing waste through efficient and responsible management and equitable distribution of costs

The strategy has 10 targets:

- practical and enforceable regulations for waste management enacted by 2019, and enforced beginning in 2020
- increase the percentage of the population aware of and engaging in good solid waste management practices by at least 10% yearly over the 2017 levels
- solid waste management integrated into the Nauru school curriculum by 2017
- by 2017, adequate numbers of trained staff are effectively implementing the National Solid Waste Management Strategy, and there is a plan in place for continuous staff development
- improved operation and management of the NRC-managed dumpsite by 2017 in order to extend the operational life and minimize the pollution risks and other environmental impacts (odours, pests, fires, etc.)
- an efficient and sustainable collection system in place by 2018

- 30 % reduction in the amount of solid waste requiring disposal to landfill by 2020 compared to 2017 baseline data
- 75% reduction in bulky waste stockpiles by 2020
- fair application of the polluter pays principle — i.e. those who cause pollution should pay the cost of managing that pollution
- at least 15% of the waste management budget generated from sustainable means by 2020, and 30% by December 2023.

2.5 Education Footpath IV Strategic Plan 2017–2021

The Education Footpath IV Strategic Plan 2017–2021 has the following infrastructure-related objectives:

- internet connectivity for all schools
- libraries resourced and staffed
- TVET facilities resourced for AQF compliance
- memorandum of understanding for operational for management of learning village
- buildings manager provides services as per buildings policy
- assets manager accountable for logistics and stocktaking.

Physical resources outlined in the plan include (i) logistics, (ii) inventories and audits, (iii) repairs and maintenance, (iv) budgeting, (v) buildings, (vi) information and communication technology, (vii) student learning needs and supplies, (viii) library books, (ix) TVET supplies, and (x) internet connection in all schools.

National Health Strategic Plan 2016–2020

The National Health Strategic Plan 2016–2020 has four focus of attention:

- Key Result Area 1: Health Systems
- Key Result Area 2: Primary Health Care and Healthy Islands
- Key Result Area 3: Curative Health
- Key Result Area 4: Support Services and Networking.

Under each of these four areas, some tasks relate infrastructure in the form of unspecified or unquantified building development or renovation or medical equipment purchase.

2.6 Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONadapt), 2015

The Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONadapt) document provides a multi-sectoral action plan for climate change adaptation and disaster risk reduction summarized in the Table A-3.

Table A-3: Nauru Framework for Climate Change Adaptation & Disaster Risk Reduction

Sector	Activities
Water	• Fill information gaps and increase access to baseline information about the water sector • Increase water supply and storage capacity • Reduce water demand through appropriate conservation measures • Rehabilitate and protect groundwater resources • Disaster and contingency management for water sector
Health	• Fill key knowledge and awareness gaps to reduce community health risks, including those relating to the impacts of climate change • Reduce chronic health problems of the community • Expand environmental monitoring capacity • Build human capacity of health services • Secure key health infrastructure and services against extreme events
Agriculture	• Improve water security for agricultural needs • Increase household engagement with agriculture and livestock • Improve grower skills and practices
NFMRA	• Fill knowledge gaps-identify and document vulnerable fisheries and marine resources • Support a community-based ecosystem approach to fisheries management • Promote aquaculture as an important contributor to food security that can reduce pressure on coastal fisheries • Strengthen the human capacity of government and community stakeholders
CCA & DRR	• Fill knowledge gaps and ensure equitable access to information • Improve community preparedness and response systems
Energy	• Reduce electricity demand for water • Expand renewable energy capacity • Reduce transport fuel use while ensuring mobility • Improve local capacity for managing and maintaining a sustainable energy sector • Reduce risk of major fire outbreak at tank farm
Land management & rehabilitation	• Increase availability and productivity of land resources • Improve waste management to reduce land degradation and contamination risks
Infrastructure & coastal protection	• Reduce coastal risks to key infrastructure • Reduce flooding occurrence and intensity
Biodiversity and environment	• Designate areas for conservation of biodiversity • Protection of flora and fauna, through control of invasive species
Community development	• Take greater account of gender in planning • Implement community development strategies of the Ministry of Home Affairs, relating to women and youth, family services, preservation of cultural resources, and livelihood development
Education and human development	• Skills transfer to local Nauruan's during development projects