

LOW CARBON DEVELOPMENT POLICIES, THE ENVIRONMENT AND THE LAWS - NIUE

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Niue has a very small population but also aspires to reduce its carbon footprint by following low carbon development policies. This article addresses four priorities for Niue and some of the legal, social and environmental factors that are relevant for Niue to meet its energy policy goals.

Niue a une très petite population ce qui ne l'empêche pas d'avoir pour ambition de limiter son empreinte carbone en adoptant des politiques de développement à faible émission de carbone. Cet article examine les quatre priorités énergétiques de Niue et détaille quelques un des facteurs juridiques, sociaux et environnementaux qui apparaissent les plus pertinents pour atteindre les objectifs de la politique énergétique de Niue.

I BACKGROUND

This paper introduces material on low carbon development policies, energy and the achievement of the policies in Niue. The paper is in four Parts. Part I describes the policy background and proposes four priority areas that need to be addressed in the context of the policies. Part II reviews relevant legislation, and Part III the public service capacity implications of the policies. Part IV makes some recommendations by way of a conclusion.

A The Electric Power Supply Act 1960

The Electric Power Supply Act 1960 is the principal Act regulating the supply of power. It was suitable for the circumstances of that time, but insufficient to capture the changes in later years. Until 2005, there was no review or change to the Act or any documents supporting or varying its application. Two documents created in 2005 supporting the supply of power were the:

- (i) Niue National Energy Policy; and the

* HK Law, Niue. This paper has been adapted from the Aerean Project PMCU, Government of Niue.

(ii) Niue National Energy Action Plan.

Another decade later, the Niue Strategic Energy Roadmap 2005-2025 (NiSERM) was created. These policies and the work implemented under them prompted a review of the Act.

The review was undertaken to pool activities involving energy supply and development. The work formed part of Niue's response to climate change obligations under the United Nations Framework Convention on Climate Change. Considerable urgency came from the NiSERM target to reach 80% renewable energy generation by 2025. At the time of the creation of NiSERM, power generation by renewable energy was nominal at 1.99%.

B Niue Strategic Energy Roadmap 2015-2025 (NiSERM)

The NiSERM focuses on three energy goals:

- (1) Significant renewable energy integration to the grid;
- (2) Improve energy efficiency in the electricity and transport sub-sectors; and
- (3) Reliable energy supply.

Goal 1

Target: 80% renewable energy generation by 2025

As at February 2021 – the percentage of power generation by renewable energy is approximately 40%.

Goal 2

Targets:

- (a) Niue Power Corporation station losses maintained at an acceptable level of 4% by 2020
- (b) Power generation efficiency maintained above 4 kWh/litre in 2017
- (c) 10% electricity savings on residential, commercial and government by 2020
- (d) 1% of fuel-efficient vehicles by 2020
- (e) 90% households use LPG for cooking

LPG cooking gas started as a project implemented by Niue Bulk Fuel. However, at the end of the project, the work was discontinued. The duties inherited under the initial project were absorbed into the functions of Bulk Fuel which is now in the process of renewing gas bottles and fittings. However due to the lack of maintenance under the project, more and more households are returning to cooking by electric stoves.

Goal 3

Targets:

- (a) Increase fuel supply security days to 60 days (baseline is 28 days in 2014)
- (b) Keep the average forced outage to below the regional average of 5.4 %
- (c) Keep the SAIDI at less than the regional average goal of 200 minutes per customer.

Shipping services have stabilised in recent years and that has removed the pressure to maintain fuel supply at 60 days.

II LOW CARBON DEVELOPMENT – RELEVANT LEGISLATION

Renewable energy and energy efficiency thus far have had specific applications. Renewable energy relates to sources of energy for power generation and energy efficiency relates to use of products that conserve energy. Despite the changing terms, the big picture shares the same goal. That is, the limitation on greenhouse gas emissions.

The term 'low carbon development' casts a much wider net in that it "re-thinks development planning and proposes structural solutions (such as alternative infrastructure and spatial planning) with lower emission trajectories".¹ For the future of Niue, a low carbon development approach is encouraged to achieve development that is energy efficient, low maintenance, sustainable and resilient. Four priority areas for utilising low carbon development principles are proposed here; land use, buildings or the built environment, transport and finance.

A Priority Area 1: Low Carbon Development and Land Use

Land use is a key area that influences the nature and scale of carbon emissions. The facilities and activities on land are dependent on energy derived from fossil fuel. With the exception of government owned solar powered facilities, the majority of land use activities rely on fossil fuel energy. This means, there is high carbon emission within the local context. Without alternatives or slow progress to adopting alternatives to fossil fuel energy supply, Niue's future emissions may not change or may increase. On the other hand, Niue is a sink at the global level.² Its emission levels are nominal by comparison to developed countries. For the sake of achieving

1 Morita et al, 2001, Low Carbon Development <sustainabledevelopment.un.org>.

2 Government of Niue – Niue Intended National Determined Contributions <<https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Niue%20First/Niue%20INDC%20Final.pdf>>.

a sound future, it would be wise to align low carbon development with existing sustainable development work.

Niuean land in relation to development is looked at here to give an overview of the inefficiencies that need to be dealt with in order to provide a fresh start for development.

The Constitution, Niue Act 1966, the Niue Amendment Act (No 2) 1968, the Land Act 1969, and the Environment Act 2015 provide rules for the ownership, alienation and use of Niuean land. Consequently, land use today is a result of the controls set by those rules.

Sales are prohibited except to the Crown. Leases have a maximum 60-year life span. Leases granted for public or church purposes not exceeding 60 years can have perpetual rights of renewal. Niuean land remains the most valuable resource that could support development.

The above arrangements have had the following indirect impact on the energy sector.

The Niue Power station is located on land, the lease for which has now reached its termination date. The national grid (transmission lines and transformers) are located along the legal road. Some of the transformers located off road are situated on private land.

Most government departments are located in the capital, Alofi – most on Crown land but some on Niuean land leased by government for public purposes. By 2018, many of these leases have reached their termination date. There are no rules for determining land values and in effect, leases do not reflect the true value of Niuean land. This impacts on renewal.

The future of Niue's development landscape depends on a strong partnership between government and landowners. Most notably the Alofi South landowners. Inclusion of landowners and the community (village council) in development planning at early stages can help parties form partnerships for mutual benefit. The same inclusion should apply throughout the island.

Lease agreements normally require that lessees use the land for the specific purpose it was taken for, followed by requirements to maintain the land. With these measures in place, maintenance of the facilities on land is mandatory. Maintenance of leases equals the maintenance of improvements to the land. This was to allow for a smooth transition to retrofitting infrastructure with energy efficient lighting and cooling systems.

The neglect in the leaseholds of private land for public use has caused a gap between landowners and government. The existing administration of land leases for public use is not sustainable. The impact of this flows on to private leases; parties to private leases also lag in their commitments.

Other legislation relevant to land is discussed in the following sections of this paper.

1 Public Health Act 1965

This law places responsibility on the Director of Health to limit, prevent or suppress infectious diseases. There is power to enter premises to undertake public health inspections. Public health has a direct correlation to environment protection in respect of diseases that arise from poor sanitation, dumping or cleaning practices. Practices and habits that increase risk to human health eventually impose a risk on the integrity of the environment.

Environment health ensures that public health is maintained and that the water supply is free from contamination. There is however sufficient peer pressure between households and between villages to maintain cleanliness. Beyond this social behaviour there are offence provisions to enforce good public health. There are no data to illustrate how or whether these provisions have been of good use.

Section 43 in relation to dwellings provides –

- (c) The dwelling shall be provided with a properly built and maintained latrine. Pit latrines shall be placed not less than twenty feet from any dwelling, building or public place. Every latrine shall be kept thoroughly clean at all times.
- (d) Any enclosure for animals or birds belonging to the dwelling shall be placed not less than 66 feet from the dwelling and shall be properly kept and maintained;
- (d) Every dwelling and land belonging to such dwelling shall be kept free from leakage in any drain or sanitary convenience and from any other nuisance which is offensive or likely to be injurious to health;
- (e) All land, sheds, and other outbuildings belonging to the dwelling shall be kept in a state of reasonable cleanliness and refuse and rubbish shall be disposed of as circumstances require.

These rules support cleanliness and the proper disposal of rubbish and refuse but apply only in respect of private dwellings. They do not extend to public places or to coastal sea tracks or public gathering places. This Act has no regulation-making power.

2 *Maritime Safety Act 2021*

This law provides for the order and good government of Niue and with provisions relating to security of the wharf. There is, in the General Laws Act 1968, a regulation making power for the implementation of the International Convention for the Safety of Life at Sea 1974, the International Shipping and Port Security Code and any other international standard, requirement or recommended practice relating to maritime and port security. Regulations may be made in relation to fees and charges, offences and penalties for the contravention of regulations.

The above rules deal with safety and security in travel, trade at the wharf with a view to addressing and minimising security risks. The carrying of ballast water to provide stability and movement of a vessel arises. Ballast water presents risks to the coastal ecology of the wharf and its surrounding areas if released.

3 *Territorial Sea and Exclusive Economic Zone Act 1996*

This law provides for the establishment and management of activities within the territorial sea, the exercise of the sovereign rights of Niue and provides for the exploration and exploitation, and conservation and management of the resources of the zone.

Section 60(2) provides for regulation making powers by Cabinet to address among other things –

...

- (t) The prevention of marine pollution, whether originating from a land-based source or by discharge at sea;

...

- (v) Prescribing measures for the protection of marine life;

...

- (z) Giving effect to the following International Conventions upon their ratification by the Government of Niue and their entry into force under international law or for Niue, as the case may be –

- (i) The United Nations Conventions on the Law of the Sea 1982;
- (ii) The Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of December 1982 (UNCLOS) Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995 (UN Fish Stocks Agreement);

- (iii) The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (the WCPT Convention).

UNCLOS requires states to make provision for the prevention of pollution. The relevant articles, in summary form are –

Article 196 (1) States shall take all measures necessary to prevent, reduce and control pollution of the marine environment resulting from the use of technologies under their jurisdiction or control, or the intentional or accidental introduction of species, alien or new, to a particular part of the marine environment, which may cause significant and harmful changes thereto.

Article 207 requires states to adopt laws and regulations designed to minimize to the fullest extent possible the release of toxic, harmful or noxious substances, especially those which are persistent, into the marine environment.

Article 208 requires coastal states to adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with seabed activities.

Article 209 requires states to adopt laws and regulations to prevent, reduce and control pollution of the marine environment from activities in the area undertaken by vessels, installations, structures and other devices flying their flag or of their registry or operating under their authority, as the case may be.

Article 210 requires states to adopt laws and regulations to prevent, reduce and control pollution of the marine environment by dumping.

Article 211 requires states to establish international rules and standards to prevent, reduce and control pollution of the marine environment from vessels and promote the adoption, in the same manner, wherever appropriate, of routing systems designed to minimize the threat of accidents which might cause pollution to the marine environment, including the coastline, and pollution damage to the related interests of the coastal States.

Article 212 requires states to adopt laws and regulations to reduce and control pollution of the marine environment from or through the atmosphere, applicable to the air space under their sovereignty and to vessels flying their flag or vessels or aircraft of their registry.

There is direct reference to rules for the prevention of pollution from land and at sea. This renders this Act the most appropriate home for regulations on these matters.

4 *Water Act 2012*

This law provides for the protection of water resources with a specific focus on licensing and the prevention of practices that pose a risk for the integrity of the water table. There is direct correlation here with the public health measures under the Public Health Act 1965.

In a pilot exercise for the village of Alofi South for water and waste management,³ contamination activities that impose a risk to underground freshwater and coastal waters protection were identified as –

- (i) Household sewage septic tanks;
- (ii) Sewage and sludge disposal;
- (iii) Agri chemicals its safe management and reduction in use;
- (iv) Livestock on its maintenance and keep;
- (v) Waste oil and its proper disposal;
- (vi) Rubbish dump at Makato and its proper management;
- (vii) Household cleaning and safe use of household cleaning chemicals;
- (viii) Storm run-off and drainage in respect of road sides during wet season.

There is no surface water on Niue, therefore the threat of water-based waterways carrying waste and wash out to sea does not exist. Despite the known risks, the struggle with basic maintenance problems such as leaking taps, empty water reservoirs, and litter is constant.

5 *Environment Act 2015*

This Act provides for the preservation and protection of the environment and authorises the making of environmental standards to regulate activities affecting the environment. The environment is defined as:⁴

- (a) all natural and physical elements; and
- (b) includes –
 - (i) land, marine areas, freshwater supplies, and air; and
 - (ii) ecosystems and their constituent parts, including people and communities; and
 - (iii) the natural and physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence,

3 Alofi South Village Water and Waste Management Plan 2010, IWRM-GEF and EU-IWRM Project.

4 Section 3, Environment Act 2015.

and cultural and recreational attributes (commonly known as amenity values).

Waste is defined as anything disposed of or discarded and includes waste water and other waste such as human waste, animal waste, organic waste, electronic waste, hazardous waste, and construction or demolition waste.

Section 15 prohibits the disposal of waste or other matter including litter in a manner that contravenes an environmental standard unless expressly authorized by Act.

Section 17 prohibits a person from doing anything in relation to the marine area in a manner that contravenes an environmental standard established for the protection of the environment.

Activities that may have a significant impact on the environment are required to apply for a development consent. Part of the process for determining whether or not to issue a development consent is the making of an environment impact assessment.

6 *Village Councils Act 2017*

This Act establishes the membership, functions and operations of Village Councils. Section 18 (a), among other things outlines functions of a Village Council to provide for, maintain and regulate –

- (i) Bush roads other than public roads;
- (ii) Sea tracks and access to the sea and fishing grounds;
- (iii) Public parks, gardens, recreation areas, scenic sites, and look-outs, and other public places, reserves, and land vested in the council or placed under its control either permanently or temporarily;
- (iv) Public bathing places, shelter sheds and other places for public decency;
- (v) Buildings, places of public recreation, stalls and stands on roads;
- (b) the provision of services relation to health, sanitation, prevention and suppression of infectious diseases, and the disposal of the dead, including –
 - (i) services for the purposes of establishing and maintaining village cleanliness;
 - (ii) the prevention of pollution of water sources and land resources...

This Act provides for local government to assist with managing the village infrastructure and its members. A village council may pass by-laws necessary for managing their area.

There is regulation making power provided for by this law. One idea for achieving low maintenance and highly functional and highly connected public spaces is the

reducing the distances between facilities. For instance, Alofi South is very spread between Paliati area where the schools are located and access to main roads connecting to the eastern side, central area which is coastal, and Fonuakula consisting of the airport, hospital and the newer developments. The areas are sparsely located and it would be challenging to connect the areas with walkways and bikepaths for non-motorised transportation. The distance between the hospital, airport, government offices, schools and the shops needs an alternative connecting travel route in order to speed up travel. One viable solution may be to revive foot tracks and short cuts used before the introduction and proliferation of motor vehicles. Re-mapping and application for access by way of foot tracks or an easement should be explored.

The smaller villages are built around the village church and field; a ring road for Alofi South could provide for walkways, bike paths and rest areas that do not require motorised travel.

7 Summary

While all of the above Acts focus on public health, protection of the environment, marine environment and the management of village facilities, there is direct correlation with the need for affordable, safe, functional and low maintenance built environment. Development would be difficult if the risk of damage to the environment and human health is high or if a development activity would lead to a deterioration of conditions. The challenge is the lack of a specific plan for development utilising low carbon processes and technology for the same goals as sustainable development. When land use is low maintenance and cost efficient, the chances are high that it is also less damaging to the environment. It would be useful to compare the proportion of undeveloped and green open spaces to the built area and the non-built area over the last twenty years (2021-2001). This can show whether low carbon development principles have been used and how much of it successfully used. Next would be to use this data to plan development over the next twenty years.

B Priority Area 2: Low Carbon Development and Buildings

The first advance in Niue's building landscape was in the 1960s establishing the infrastructure for the Government of Niue. The first generation of hurricane homes also started in the same period. Many of those homes are still occupied. Many are also derelict. Residential and community buildings account for the third largest

consumer of energy supply after transport and energy supply⁵.The NiSERM provides:⁶

the GON will undertake a number of programmes to improve energy efficiency in the commercial and residential sectors. These should further reduce the national energy demand and at the same time result in savings for consumers... .

Of the approximately 700-800 residential homes, at least 70% are from the hurricane homes period. Because of a very small building industry, home maintenance over the years was limited. Destruction of homes by cyclones and the fast wear and tear from the harsh weathering conditions also contributed to their decline. A fast response is needed to counter the harsh weathering conditions that the building infrastructure is exposed to. In addition, the repair and or construction of new buildings is needed. Villages located on the South-West Coast face the risk of wind and sea salt exposure. Over time, the majority of Niue's residential homes have fallen into disrepair. Many government offices and buildings also require repair.

This debilitated state of Niue's housing stock is a barrier to a low carbon future. Under the Public Health Act 1965, rules relating to sufficient ventilation, lighting, cleanliness, installation of toilets and septic tanks, enclosure of birds and animals belonging to the household and all land, sheds and outbuildings connected to the main house must be kept clean and fit for human habitation. Buildings in a state of disrepair and likely to cause risk to human health may be subject to a closing order or a demolition order. The number of unoccupied homes with absentee landowners is an issue. Nevertheless, there is a gap in the administration and enforcement of these specific provisions of the Public Health Act.

Buildings once erected on land become part of the land. New builds are limited to land that is close to existing utility infrastructure. In the absence of regulations for the reticulation of power, new home-owners find it expensive to build away from the existing infrastructure. Pressure to move from low lying coastal areas to the upper terrace is difficult without access to utilities.

Private dwellings are on prepay for power. Government buildings, water bores, and water reservoirs are on post pay.

5 Total final energy consumption, at 11. Niue Strategic Energy Roadmap, Government of Niue 2015.

6 NiSERM financing plan. Niue Strategic Energy Roadmap, Government of Niue 2015.

The construction of Niue's buildings is regulated under the Building Code Act 1992. The Act focuses on the safe construction and functionality of a building. There are no provisions on low carbon and energy conservation principles.

As the key regulatory office, the Building Division offers limited intervention in the maintenance of building standards or inspections. There is no licensing of builders and therefore limited control on building permits. Consequently, there is a mix of local, foreign and do-it-yourself home builders. With adequate human resources, proper office space, transport, equipment and storage, the regulation of the building sector can improve.

Village Councils need to be given the power to assist with assessment and approval of building permits and inspection processes. Through this involvement, a Village Council can assist in the design and control of their own built environment. Village Councils may establish and maintain plans for schemes or development schemes in the council area. Among other things, Village Councils may take action considered desirable to improve standards of housing.

Additionally, economic incentives are needed to develop the private sector building industry in order to support future building work in Niue. Niue may need to import qualified and skilled individuals under special permanent residency provisions in order to fulfil growth needs.

C Priority Area 3: Low Carbon Development and Transport

Excluding the power sector, the transport sector accounts for the largest consumption of fuel and greenhouse gas emissions.⁷ Under the Infrastructure Plan 2016, the regulatory unit under the Department of Utilities is responsible for buildings and roads. The Transport Act 1965 is administered by the Police Department. The Civil Aviation Act 1990 is administered by the aviation sector located at the Hanan International Airport. There are several pieces of legislation involving the territorial sea, maritime zones and merchant shipping, but none specific to sea transport, the wharf or seatracks. To date, the sea port and sea tracks are administered by policy.

Prior to border restrictions in 2020, Niue's tourism industry was in the early stages of growth. Increasing numbers of visitors stimulated growth in the vehicle rental business which led to busier main roads. The seaport wharf provides for the entry of goods and commodities from abroad, including transport.

⁷ System Average Interruption Duration Index.

Except for brand new vehicles, all motor vehicles are subject to 12.5% tax plus duty. Motor vehicles fifteen years and older are prohibited imports. This principle is applied as a matter of administration by the Customs Department.

The continuous increase in the ownership of private vehicles is the cause of high demand for fuel. Further to this, households typically own at least two vehicles. Consequently, public places experience parking congestion during peak hours. Except for school buses, there are no forms of public transport. Current rules do not provide any strategies for the promotion of low carbon forms of transport. The existing road networks are built only for motor vehicles. Secondhand motor vehicles are affordable and therefore imports of second-hand vehicles are high. There is no system to recycle or dispose of vehicles at their end of life. This adds to the build-up of derelict vehicles. Derelict vehicles are mostly found on Amanau, private land leased for public use. Derelict vehicles are also found at private homes. Without rules for land use (prohibiting neglect of land and leaving derelict vehicles) the control on litter by derelict vehicles will persist. Their removal or disposal will be at a cost. New or newer fuel-efficient vehicles with a longer lifespan should be encouraged to avoid adding to the pile up.

The Transport Act 1965 deals with control of vehicles, roads and road traffic. Owners or occupiers of land adjacent to the public road must keep the road from their boundary to the centre of the road free from rubbish, weeds and fungoid growth. All persons are prohibited from depositing rubbish in a public place.⁸

Maintenance of the road network is provided for under the Infrastructure Plan 2016. Its implementation is expected to occur over the next few years. The Transport Strategy 2016-2026 outlines priorities for investment and development. Both are subject to the Transport Act 1965 and the Civil Aviation Act 1990.

The advantage of these sector specific plans is the grouping together of land, sea and air transport sectors. In this manner, the transport sector maintenance and investment goals are under one document. However, it is necessary that these plans be understood to complement existing work structures established by statute and not as a replacement for statute.

Civil aviation experienced increased activity due to tourism development up until the Covid-19 pandemic in 2020. The border closures impacted on the aviation industry worldwide including Niue. Plans are under way for the resurfacing of the airport runway. Car-parking and upgrading of the airport building is recommended under the Infrastructure Plan 2016. These are subject to the standards set by the

8 Transport Act 1965, ss 82-83.

Convention on International Civil Aviation and the New Zealand Civil Aviation Rules.

The Civil Aviation Act 1999 regulates civil aviation and related purposes. The administration of the whole civil aviation sector is by a Director of Civil Aviation. Section 6 provides:

- (1) It is the duty of the Director to administer this Act
- (2) In particular, the Director must –
 - (a) Monitor adherence to safety and security standards within the civil aviation system; and
 - (b) Ensure regular reviews of the civil aviation system to promote the improvement and development of its safety and security; and
 - (c) Investigate and review civil aviation accidents and incidents; and
 - (d) Prepare and maintain an aviation security programme for Niue and ensure its implementation; and
 - (e) Provide the Minister with any information and advice the Minister requires.

In light of the growth envisaged in the coming years and the unique skill required to maintain the aviation industry, support by way of policy and law is required in the development of regulations under the Civil Aviation Act 1990.

D Priority Area 4: Low Carbon Development and Finance

A key factor in any development is the availability of finance. For many of the priority areas identified – the changes sought require significant financial investment. This section looks into the financial framework available in law and identifies challenges and opportunities. This sub-part supports the financial plan provided for in the NiSERM.⁹

Sources of finance available at the international level include various projects linked to the United Nations Framework Convention for Climate Change. The AREAN project is the first that is dedicated solely to low carbon development.

There is only one bank in Niue, the Niue Development Bank (NDB), which operates with Kiwibank.¹⁰ It is governed by the Niue Development Act 1993. Its functions are to provide finance for the establishment, development, extension or assistance of industry and economic development in Niue; encourage and promote

9 NiSERM financing plan, pp 35. Niue Strategic Energy Roadmap, Government of Niue 2015.

10 Niue Bank (Kiwibank Limited and the Niue Commercial Enterprises Limited) Regulations 2013.

investment in the economic development of Niue; provide finance for dwellings and improved housing and living conditions in Niue; to provide technical assistance or advice; and to generally foster economic development in Niue.¹¹

Under the Niue Development Act 1993, economic development is defined as development in conformity with development priorities of Government including development in engineering, construction, transport and housing among others.¹²

Economic development in recent years has focused on the tourism sector. This showed a need for development in general infrastructure.

Over the period July 2017 – March 2020, the NDB administered a low carbon development fund for Government and the United Nations Global Environment Facility. Its purpose was to enable access to energy efficient household appliances through a 25% rebate. One of the issues encountered was the lack of awareness at the initial stages of the scheme. A brief report by NDB indicated the lessons learned.¹³

III ASSESSMENT OF THE COMPETENCIES IN THE NIUE GOVERNMENT DEPARTMENTS

Niue's economy for low carbon development is dependent on its knowledge systems and implementation by institutions in the public sector. Knowledge and commitment to established rules and institutions develop at different levels over a period of time.

In view of the forecasts for energy development using renewable energy and energy efficient technology, Niue's institutions are not adequately equipped with the human and other resources to undertake what is required. Many different factors contribute to this, one of which is the limited pool of talent to draw from in a very small population base. To sustain changes and development identified in Part I, a system of events likened to the four seasons of the year would be appropriate. Nature's four seasons are a clock work of growth and blossom in spring, rest and nest in winter, shedding and renewal in autumn and work and harvest in summer.¹⁴ This can be achieved by closing the gap among public institutions through effective communication and structured training over an agreed timetable. Secondly,

11 Section 16(1).

12 Section 2.

13 Wayne McCaughan, General Manager Niue Development Bank "NDB Summary and Recommendations" 21 January 2021.

14 Jim Rohn "Are you using the seasons of life?" <<https://www.jimrohn.com/are-you-using-the-seasons-of-life/>>.

efficiency could be increased by teaching and learning of law and policy in a supported environment so that there is real time compliance with the rules. Thirdly, a long-term training strategy for the training and mentoring of the new generation is required. Making these connections can result in a synergy of a consistent circle of giving and receiving.

A main constraint among institutions is the lack of experienced personnel with the knowledge and skills to undertake work. This is evident in the modest changes achieved to date. Unfortunately, solar installations imported and installed by donors are left without robust technical or maintenance support. Although these new interventions are made with the best intentions, they add responsibilities to the current organisation and therefore additional pressure.

For example, the shift from diesel generators alone to a mix of renewable energy generation at Niue Power requires specific skills. The installation of solar farms, and batteries at the power station requires new skills and ongoing maintenance. Observations and data recording of power generation are necessary to run the system, and also useful to determine savings from fuel. Niue Power performs this function to a limited extent. The sale of power is administered by Kiwibank and Telecoms. Consequently, Niue Power does not have access to live information on how much power is generated and sold in order to determine the state of the power supply. Additionally, the absence of a complete real time data collection and analysis prevents early detection of faults and problems.

At the close of 2020, at least nine staff were retired from the Ministry of Infrastructure. Some of the staff were from the Department of Utilities at Niue Power and the Regulatory division. The distance between senior staff and junior staff is very wide and creates the problem of unfilled senior roles. Formal training abroad takes up to three years and it takes at least five years for an individual to gain senior level work experience.

Staff shortages and lack of succession planning are real impediments to progress. There is no role, desk or office dedicated to renewable energy power generation. The goal to reach 80% renewable energy power generation by 2025, requires an increase in the management and maintenance of renewable energy installations.

Advances and upgrades in low carbon technology require skilled personnel to regularly upskill during the course of their tenure. The presence of skilled individuals working in a team towards common goals is needed. Without a strong workforce, the risk of waste is high.

IV RECOMMENDATIONS FOR LOW CARBON DEVELOPMENT POLICIES

NiSERM provides an implementation framework led by a steering committee with the Ministry of Infrastructure acting as the main coordinating body. To date, it appears all responsibilities are with the Department of Utilities. Since 2015 progress is under way in several areas. A report specifically on the monitoring and evaluation of progress under the roadmap is yet to be confirmed.

From a legal framework perspective, a major challenge was presented by the shuffling of public institutions during the public service transformation in 2013. Article 62(1) of the Constitution provides:

...there shall be a Niue Public Service comprising such employees as may be necessary to assist the Cabinet in exercising the executive authority of Niue and to perform such other functions or exercise such powers as may be prescribed by law.

Article 68(2) provides:

Subject to this Constitution and to any enactment, the Commission may prescribe and determine the terms and conditions of employment of members of the Niue Public Service, and may issue such instructions or exercise such other powers as may be necessary to enable it to perform the functions and carry out the duties described in this Constitution or conferred on it by law.

During the transformation, key departments were re-organised under the three ministries of social services, natural resources, and infrastructure. Others were organised as central agencies and the balance were placed under a commercial and trading arm. Niue Power was for a number of years moved under the commercial and trading arm as a state-owned enterprise. In recent years, it was returned to the Department of Utilities. New bodies were also created such as a Department of Transport and the project management and coordination unit. The transformation shuffled roles and personnel, and created new roles as well as replacement roles. These changes were made by a policy and decision of Cabinet. The magnitude of the change, public expenditure, and the functions and powers of employees requires a strong base conferred by law. Without enactment, the ad hoc nature of the public service framework is vulnerable to ambiguity and inefficiency and jeopardises Niue's low carbon development future.