



GEF Pacific IWRM Demonstration Project

Using integrated land use, water supply and wastewater management as a protection model for the Alofi town groundwater supply and nearshore reef fishery



Niue

Final Report

Niue

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PREFACE

Niue relies on groundwater as its main source of water supply. Currently the island is only using 2% of its sustainable yield (GWP 2006), as developments occur this may increase to 3%. There is no surface water on the island, therefore actions to mitigate risks to ensure water security and safety of drinking water quality is of highest priority for the government and village communities. The water resource comprises solely of single groundwater lens with low volume household rainwater catchments providing a small supplementary supply in rural communities. The water lens is recharged through rainfall which permeates through the predominantly limestone soil profile to recharge the groundwater lens (aquifer). This means that any discharges whether through human waste, agriculture or industry has great potential to contaminate the water lens if proper measures are not taken to improve management of discharges from land based activities.

According to the 2011 census, 98% of households are connected to a reticulated public water supply system including motels and hotels. This reticulated water supply is untreated. The reticulated water is managed by government agencies and supplied free of charges to all consumers, including industrial, commercial and agriculture users. A Levy is currently imposed on the fuel cost to pay for the electricity costs of pumping water.

Septic tanks are the most common way of treatment for all domestic and tourism wastewater on the island. The exceptions are piggeries and agricultural wastewater. Septic tank construction is guided by the National Building Code, endorsed in the early 1990s, and reviewed in 1999. All new construction of private, government or industrial facilities must comply with the code when applying for development or constructions. Government has secured finance and is in a process of reviewing the National Building Code and Building Act. This was recommended under this IWRM Demo Project to ensure that a national guideline for all wastewater effluent is developed. The same review suggested that measures such as proper design, construction and inspection mechanisms are in place.

The enactment of the Water Act 2012 is the paramount achievement of IWRM Project, it took the department 5 years of public and political consultations before it finally enacted. This legislation is the first national legislation administered by three government agencies. The legislation is drafted using the IWRM concept of integrated management administered by three government agencies, public works, health and environment.

The National Water Steering Committee (NWSC), an apex body was formulated as part of the project. This was endorsed by Cabinet Ministers to manage both GEF IWRM and PACC Project. The NWSC is stipulated under the Water Act 2012, and a regulation has been drafted for Cabinet endorsement. The IWRM demonstration project is important and timely for the implementing agency to coordinate and maximise our opportunity with the limited resources in place to implement activities that help integrate our water and sanitation issues into National Reporting priorities. It runs parallel with the Government implementation of the Niue National Strategic Plan (NNSP 2009-2013). This has enabled us to link our project activities with the NNSP at the same time becoming further involved in national review of the NNSP. Formalising the NWSC as a stakeholder body to manage two GEF projects, the IWRM and PACC in coordinating the activities, demonstrated the integrated approach and maximised our resources.

The support from both Pacific EU and GEF IWRM projects in Niue strengthens the government functions in coordinating various water awareness campaigns that raised the profile of water to all stakeholders on the island. The project assisted the department with financial support to implement various water activities and various awareness programs that helped stakeholders understand water-related issues and the required protection measures for the island's main water resources. Activities included a national song quest, annual commemoration of world water day event, village marine and show days, schools annual prize giving, national radio and TV programs and national consultation workshops.

Niue recognises the impact of climate change. This hit home with the destruction to the island caused by Cyclone Heta in 2004. Damage to the coastal areas and settlement, including key government infrastructure, forced relocation of these key government infrastructure to the upper terrace and closer to catchment areas. This is now a key challenge in the protection of the island's main water source as it is more vulnerable to pollution.

The Pacific IWRM National Demonstration Project has come to end and preparation is now for the 2nd phase. The implementing agency, key national Government departments and the NWSC continue to maintain the integrated approach on managing the water resources. As waste and sanitation are the key threat it is our duty and role as the implementing agency to ensure that the livelihood of our people is maintained.

To conclude, as the chair and the national focal point for the IWRM Project I extend my sincere appreciation to GEF and its implementing agencies for the support towards this project, my colleagues at the regional coordinating unit for your great effort of ensuring that this is not the end of IWRM but work tirelessly to securing further funding to maintain the program in our region. Lastly, to my national project management unit and the people of Niue who involved in this project to thank you for your support and to our PACTAM technical advisor for valuable input towards the project.

Mr Deve Talagi





1. Water and Sanitation Issues in the Development of the Niue GEF Pacific IWRM National Demonstration Project

The GEF Pacific National Demonstration Project was developed through a staged process by developing the National IWRM Diagnostic Report overview of national water and sanitation issues, identifying challenges and opportunities using the application of IWRM concepts and conducting a Hot-Spot Analysis to prioritise national issues to guide the selection of a national demonstration project including processes of national stakeholder consultation.

The Niue diagnostic report outlined the island's challenges in water and sanitation management prior to the development of the IWRM Demonstration implementation plan. This report guided the national implementing agencies in scoping the development of the IWRM National Demonstration Project outcomes. It focused on harmonising the national water and sanitation issues using an IWRM approach consisting of 6 key thematic areas linked to the Pacific Regional Action Plan on sustainable water resource management.

The report summarised various national water and sanitation program reports and studies, including other water-related programs that were previously implemented. It made the following recommendations for priority issues in water and sanitation for Niue:

- Strengthen its capacity to conduct water resources assessment and monitoring as the key component of sustainable water resources management.
- Formulate and implement strategies to utilise appropriate methods and technologies for water supply and sanitation systems.
- Implement strategies to protect watersheds and the remaining forest from further depletions, which have included the identification of critical habitats other than the Huvalu Conservation Area.
- Strengthen capacity development to enhance the collection and application of climate information to cope with climate variability and change.
- Promote the change paradigm for dealing with island vulnerability from disaster response to hazard assessment and risk management, particularly in IWRM.
- Set up a high quality participatory framework to allow for open participation of stakeholders in sustainable water and wastewater management.
- Include water and sanitation in the formal education system.
- Improve the communication and coordination of all stakeholders in sustainable water and wastewater management including government, NGOs, civil society and private sector.

- Identify appropriate institutions, infrastructure, and information to support sustainable water and waste water management.
- Continue collaboration with regional and international partnerships to facilitate appropriate assistance in all areas relating to water resource and wastewater management.
- Support regional training programmes resulting in sustainable levels of skills and knowledgeable people within water and wastewater management.
- Work together through a comprehensive consultative process, encompassing good governance, to develop a shared national vision for managing water resources in a sustainable manner.
- Work together towards developing and strengthening national instruments, vision, policies, plans and legislation taking into account social, economic and environmental and cultural needs of its citizens.
- Identify and promote appropriate institutional arrangements and resources sufficiently to enable effective management of water resources and the provisions of appropriate water and wastewater services
- Develop, encourage and recognise national leadership in water resources.
- Create a better and sustainable environment for investment by public and private sector, by developing and implementing national, sector, and strategic plans that identify the economic, environmental and social costs of different services and develop pricing policies, which ensure the proper allocation of resources for the water sector.
- Reduce costs through improved operational efficiency, using benchmarking development of water-loss reduction programmes, and improved work practices.

Niue's analysis of Hot-Spots and Sensitive Areas was based on the nature and significance of the islands main water resources and the common threats and risks that pose significant impact on social, cultural and economic development priorities. The analysis was quite challenging as the status of the island groundwater quality was found to be unpolluted based on national water quality analysis. Either this is a result of less development or small population density. However, due to level of vulnerability assessment and nature of the resources, land base activities were determined to be the main threat to groundwater resources. Therefore infrastructure improvements were ranked high though not an area that is regionally and globally significant to GEF.

Significant coastal impacts were noted including several cases of fish poisoning, the destruction caused by Cyclone Heta, and the consequent threat to groundwater from increased development in the upper terrace. It also found that this development should be closely monitored and properly coordinated through wide public awareness. Pollution control mechanisms and institutional coordination were also found to be lacking. There are insufficient resources in place that enable proper management of the water and sanitation issues. National capacity in managing the water resource was also part of the scoping of the project to support and maximise the coordination of project activities, linking to national priority concerns.

The scoping of National Demonstration Project was based on the outcome of the diagnostic report and the hot spot analysis. Combining national issues in a context of regional and global priority concerns that fit in the GEF OP framework of investing and resourcing, found Alofi as the main centre of economic development and country focal area for marine environments that best fit for piloting the IWRM activities that make up the project.

The studies conducted in 2003 on coastal water quality found elevated level of nutrients at Alofi bay from land based activities linked to agriculture and sanitation issues. This highlighted the link between groundwater and coastal water that the scoping of the national demonstration project addressed through land based pollution reduction measures to minimise impact to coastal waters.

On-going reconstruction work after Cyclone Heta required movement to the higher terrace known as the watershed. Here several government facilities and private residential housing are constructed, closer to the catchment area. This poses high risks of pollution to the groundwater from domestic and agricultural wastes. With this trend of movement several household activities such as taro plantations and piggeries are also within the vicinity of the houses.

The outcome of the above process recognised that the projects main key outcomes to protect groundwater quality through mitigation of existing threats from contamination including providing on the ground protection measures and improving users-resource management and national policies demonstrating at the most populated village and the centre of the government infrastructure and economic development.

The projects objective was:

‘to improve water resource and wastewater management and water use efficiency in Niue to balance overuse and conflicting uses of freshwater resources through policy and legislative reform and implementation of applicable & effective Integrated Water Resource Management (IWRM) and Water Use Efficiency (WUE) plans’.

This will be based on best practices and demonstrations of IWRM approaches, using the four common key water resource management measures;

1. Mitigating of Existing threats from Contamination;
2. On the ground protection;
3. Improved users-resource Management and
4. National Policies and Coordination Body.

From the above common water resource management measures the project developed 8 main components to coordinate activities that support the project objectives.

1. On-going sound, integrated, transparent governance of Niue’s water resource
2. Water Legislation, Policy and Planning measures
3. Improved Management of hazardous and waste products to reduce risks of ground water contamination
4. Improved management of non-household chemicals, effluents and fuels
5. Improved water supply management to reduce peak demands and risk of saline up-coning
6. Improved water resource management measures
7. Education and Awareness Program
8. Delivery of the Niue GEF IWRM Demonstration Project



2. Management of the GEF Pacific IWRM National Demonstration Project in Niue

The Public Works Department (PWD) is the lead agency for the IWRM Project and is one of the largest government departments of the Niue Government which consist of five divisions; Administration; Building Construction & Engineering; Civil Construction, Roothing and Quarry; Mechanical Heavy Plan Services and; Water & Sanitation Division. The PWD vision is to provide timely and effective services to all customers in Niue in supporting the NNSP .

PWD core function is to provide timely services to all customers through building permit, inspections and building constructions. PWD provides services with heavy machineries, transportation, road constructions and sales of aggregates and water supply. PWD is responsible for port operations including search and rescue. PWD is responsible for all water resource management except the testing of water quality which is a joint operation with the Department of Health. The PWD is also responsible for administration of the National Building Code where the sanitation components of septic design and inspection fall under. This is the national policy that manages household effluent of septic tanks.

PWD is the national operational focal point for SOPAC since it became a member, this by coordinating various programs nationally initiated by SOPAC. Since then Water Supply Division become a focal point to all water and sanitation programs under SOPAC Division of Water and Sanitation under the umbrella of Public Works Department. The Water Supply Division has demonstrated various water and sanitation activities in Niue and participated in various regional water workshops and meetings.

Leading towards the implementation of the demonstration project the department with the technical assistance through SOPAC helped the Water Division undertake several water resource investigation and studies that helped guide the project and also opportunities from this project to support their recommendations.

The coordination among the government stakeholders and the communities strengthen the department functions with management of the project. Particularly with essential sectors being engaged as members of the National Water Steering Committee (NWSC) such as Treasury who are responsible for finances. Funding plays a major role in ensuring that the project is well managed by ensuring overseas suppliers are paid and that the activities are being delivered. The support given by EU IWRM National Planning through engagement of a national counterpart to support the national planning and policies was a great achievement also for the department. It helped to strengthen the coordination of the NWSC and other stakeholders.

Public works maintain on-going support for the project management staff with secure office spaces and IT communications networks including matters concerning the political levels and employment authority.

The project management unit consists of five key personnel; IWRM Focal Point, Project Manager, Project Assistant, Policy and National Planning Support Officer and the Water Supply Technical advisor from PACTAM who provided technical support. Water supply division staff includes eight tradesmen that help support project management unit with implementing field activities.

The Policy National support officer was engaged under national contract by the EU IWRM project. His contract ended in June 2012. Niue government now maintain this position through support from the national budget.

The project assistant was contracted and salary support is fully funded by the project for the duration. The project manager maintains his roles as the Water Supply Division Manager and at the same time managing the project. Salary support was funded by Government of Niue 87% and remaining 13% by the project.



Lead Agency

**Memorandum of Agreement
Signed 30th September 2009**

Public Works Department

Signed on behalf of CIE:

Mr Deve Talagi
Director of Public Works Department and,

Mr Richard Hipa
Secretary to Government- National Political Focal
Point to Regional and CROP Agencies

Signed on behalf of SOPAC:

Mr Marc Wilson, GEF Pacific IWRM Regional Project
Manager

IWRM Focal Point



Mr Deve Talagi,
Director of Public Works
Department

National IWRM Project Manager



Mr Andre Siohane
Water Supply Division Public Works Department

Assistant IWRM Project Manager



Mrs Crispina Konelio
Public Works Department

Water Supply Technical Advisor Officer



Mr Clinton Chapman
Public Works Department

Water Policy and National Planning Officer



Mr Sione Leolahi
Public Works Department



3. Establishment of a Coordinating Body for the Operation of the GEF Pacific IWRM Demonstration Project in Niue

The Niue Water Steering Committee (NWSC) was endorsed by Cabinet on the 16th of June 2009 Ref: CM(08)721. The NWSC has been set up primarily to implement the Integrated Water Resource Management (IWRM) and Pacific Adaptation to Climate Change (PACC) Projects but more importantly it is recognised as the organisation to implement integrated water resource management principles in partnership with National and Local Government, and Non-Government Organisations.

As well as being endorsed by Cabinet the NWSC is required to implement its activities pursuant to the requirements of the Water Resources Act 1996 and in fact the committee has undertaken a review of the Water Resources Act 1996 to enable a more integrated approach to water resource management, part of that being the formation of the Water Steering Committee.

The NWSC membership includes Village Councils (Local Government) by virtue of the Department of Community Affairs and Non-Government Organisations by virtue of the Niue Chamber of Commerce and NIUANGO. The full committee list and ToR can be found in Annex 1 and Annex 2.

Niue has implemented various water projects in the past has experienced members on the committee, though their time is often stretched. Lessons have been learned over the years with national coordinating bodies for projects, particularly with the ensuring sustainability and commitment of members due to the resource available and numerous commitments within each organisation.

The formulation of the Coordination Body for IWRM was expanded

to include the PACC project which had a focus on demonstrating climate change adaptation measures with water resource in Rainwater Harvesting. Due to the nature of the two projects, NWSC endorsed a proposal for the formulation of sub-committees under the NWSC body. These sub-committees act as technical advisors consisting of senior officers of various sectors. Some of the Heads of government agencies are represented in these sub-committees, particularly in the policy advisory group. Their functions are to implement activities under the Communication Strategy and liaise and coordinate national water policies and legislation. The sub-committees are;

- o Education and Awareness Sub-Committee
- o Policy Advisory Sub-Committee

Niue Water Steering Committee served as the IWRM and PACC committee. The following is a summary list of members.

1. Director for Public Works, Chairperson
2. Director for Environment, Vice Chairperson
3. Public Health Officer, Water Quality
4. Director for Met Office, climate change
5. Director for Community Affairs
6. Director of DAFF
7. Manager Water Supply
8. Water Operation Advisor
9. President for Chamber of Commerce
10. Treasury Donor Projects Officer



4. Planning Stakeholder Participation in the Execution of the Niue GEF Pacific IWRM Demonstration Project

As result of the Regional IWRM Inception meeting held in Niue 2008 and its theme 'Water is Everybody's Business', stakeholder engagement became the key of the IWRM project for Niue, ensuring all sectors of civil society were involved in decision making and informed of project progress.

Understanding the project goal and objective is important to all sectors of stakeholders from government to local communities. It is also important to understand the views of stakeholders towards the project, as it is critical to ensure that stakeholders are not misinformed or lose interest in the project during the implementation process.

The initial process was for the project to engage as many key stakeholders during the initial inception stages. This was achieved by open invitation through the national radio including open invitation to the inception meeting and launching of the project. In this way, all members of the community had the opportunity to be present during pre-implementation meetings and to be involved in the subsequent formulation of the project. The stakeholder analysis and engagement plan can be found in Annex 3.

One of the challenges in Niue in implementing such a project in the past is ensuring commitment from stakeholders for the duration of the

project. Often stakeholders have other commitments to participate in events, work or family obligations and so the timing of meetings is not always appropriate for everyone.

We found that a good way to engage key stakeholders was to separate them in to their different sectors. Identifying those that provide technical support to project activities; those who are responsible for implementing key activities; those responsible for decision making; political bodies and communities, including local and overseas exporters. Through this we eventually created the two previously mentioned sub-committees. The benefit of this was two fold; people felt useful to the project by using their particular skills and expertise, and their technical advice advanced the projects effectiveness.

Niue is a small community and has adopted various mechanisms to ensure stakeholders are informed and engaged. Through public awareness campaigns, national radio programs, broadcasting on the national television, PMU participation at schools and national event displays and involvement at community events. It was especially important that stakeholder engagement process was set in motion to have the representation of the Niuen community within the project design and ultimately gain their support and active participation in the project activities.





4.1 Gender Mainstreaming

Water plays an important role in gender in Niue. Water availability at homes has a great impact on women at home providing families, at schools, in the private sector and in the village. When water is scarce it is often harder for the women as they are household managers and responsible for family members health and well-being.

Mainstreaming gender to the project was considered in the process of inviting stakeholders to consultations and meeting. The PMU made it their responsibility to ensure a balanced gender representation at all stakeholder events and we did this in a number of ways to find the the most appropriate to our situations.

During the development of village plans the project prepared a gender analyses of water resource roles and knowledge within two

communities. Participants were divided into groups by sex, 2 male groups and 1 female group. Each group were asked to note on cards and discuss the water issues and opportunities in their village to prioritise these by ranking according to their importance to the village community. Each group presented the outcome of their group discussions and through debate, reached a consensus on the overall village priority of IWRM issues and opportunities. There was little difference between the groups: women had a slightly stronger orientation to domestic IWRM-water quality, water supply (continuity); and the men towards mechanisms and incentives for water supply and water demand management. The same sex group also analysed gender WRM roles and knowledge. Again, both sexes had similar understanding of the gender water roles and of the extensive overlap of work responsibility and knowledge.



5. Results Oriented Planning and Implementation of the GEF Pacific IWRM Demonstration Project in Niue

5.1 Logframe Development

During the inception period the project log frame was revised by the PMU with support from a local consultant and consultation with the pilot communities. This was referred to the NWSC for discussion and finalised. All matters or changes to any project activities were also undertaken in a consultative process with key stakeholders.

Later a revision of the log frame was carried out in February 2011 with the Technical support by Regional Project Coordinating Unit (RPCU) Mr David Duncan the Project Engineer, who was also the RPCU focal point to Niue. This revision was to ensure that financial support and co-funding activities is relevant including in-line with the regional project log frame.

As the project progressed the PMU made various changes in-house to the project logframe and activities during quarterly reporting in order to stream line with key priority activities and outcomes of the Regional Steering Committee meetings. These changes were referred to both RPCU with endorsement of the NWSC. A copy of the project logframe is available in Annex 4.

5.2 Priority Areas of Work and Results

The following table summarises the priority objectives and activities of the IWRM project. The full project logframe is included with this report as Annex 4.

Project Objectives	Activity
Goal: Sustainable protection and management of Niue's groundwater resources and reef fishery for improved and sustainable livelihoods, ecosystems and environmen	
Outcome 1: Ongoing sound, integrated, transparent governance of Niue's water resource	
Output 1.1 National Water Council (NWC) Established	Activity 1.1.1 Develop governance framework for ongoing NWC
	Activity 1.1.2 Secure sustainable funding
	Activity 1.1.3 Develop support structure for NWC, including an executive capacity and working groups
	Activity 1.1.4 Establish NWC
	Activity 1.1.5 Raise awareness and develop skills of NWC
	Activity 1.1.6 Develop and implement National IWRM indicator framework
	Activity 1.1.7 Develop and implement national participatory monitoring and evaluation plan
Outcome 2: Water Legislation, Policy and Planning Measures	
Output 2.1 Review and update relevant national legislation	Activity 2.1.1 Finalise Water Resource Bill linkage to IWRM Plan and NWC Functions
	Activity 2.1.2 Establish a Water and Resource Policy Advisory Group
	Activity 2.1.3 Undertake at least 3 national capacity building workshops on water and resource policies.
	Activity 2.1.4 Review and update relevant legislations to incorporate IWRM principles
	Activity 2.1.5 Develop policy measures and regulations as stipulated in the Water Resource Management Act
	Activity 2.1.6 Develop groundwater protection zones (GPZ) for Alofi Catchment
	Activity 2.1.7 Draft regulations to guide the granting of licenses for abstracting water
	Activity 2.1.8 Develop and conduct education and awareness on legislations, regulations and policies
	Activity 2.1.9 Develop Village Water Management Plan
	Activity 2.1.10 Niue Long-term Sustainable Integrated National Resource Management Strategies
	Activity 2.1.11 Define best approaches to IWRM and WUE
	Activity 2.1.12 Establish national IWRM strategy
	Activity 2.1.13 Obtain government support for IWRM



Outcome 3:		
Output 3.1 Improved compliance of septic tanks as per approved effluent standards		Activity 3.1.1 Conduct inventory of septic tank compliance
		Activity 3.1.2 Review Niue Building Code effluent requirements
		Activity 3.1.3 Remedial actions and maintenance to reduce risk of septic overflow in with the water catchment area
		Activity 3.1.4 Conduct feasibility assessment of the current septic waste open landfill
		Activity 3.1.5 Develop guidelines for septic waste removal program and implement accordingly
		Activity 3.1.6 Conduct public awareness consultations on groundwater protection and contamination
Output 3.2 Improve management of handling and disposal of domestic solid waste		Activity 3.2.1 Conduct situation analysis of appropriate disposal practices through consultation
		Activity 3.2.2 Conduct participatory planning of household handling and separation system.
		Activity 3.2.3 Conduct feasibility study on establishing a Recycling Facility
		Activity 3.2.4 Introduce and implement simple and practical methods to separate household/ domestic waste
		Activity 3.2.5 Construct medium scale re-cycling facility
Output 3.3 Establishment of fuel and oil storage standards to reduce risk of groundwater contamination		Activity 3.3.1 Conduct inventory of oil and fuel storage locations and risks
		Activity 3.3.2 Address waste oil storage concerns by purchasing tanktainer(s) to store for final disposal
		Activity 3.3.3 Develop guidelines and/or standards for fuel and oil storage
		Activity 3.3.4 Facilitating guideline uptake through training and awareness raising
		Activity 3.3.5 Develop fuel and oil leak monitoring systems supported by regulations
		Activity 3.3.6 Construct bunding wall for aircraft fuels depot
Output 3.4 Improve Management of handling and disposal of hospital hazardous waste.		Activity 3.4.1 Assess all current hospital waste disposal system/arrangements and risks
		Activity 3.4.2 Develop a hospital hazardous waste management and disposal plan
		Activity 3.4.3 Develop monitoring system for the disposal of all hospital hazardous waste
		Activity 3.4.4 Conduct in-house training of hospital staff on hazardous waste management
COMPONENT 4: Improved management of non-household chemicals, effluents and fuels		
Output 4.1 Standards and Compliance Requirements for Agro-chemical storage		Activity 4.1.1 Conduct inventory of agro-chemical storage facilities including outlets sell agro-chemicals
		Activity 4.1.2 Develop guideline and/or standards for agro-chemical storage facilities
		Activity 4.1.3 Develop relevant strategies to reduce threats of using agro-chemicals by local farmers
		Activity 4.1.4 Conduct public awareness programs targeting organic farming methods and agro-chemical storage standards
Output 4.2 Improved Piggery Facilities including Effluent Waste Management Program		Activity 4.2.1 Conduct inventory of pig pens within the catchment area through GPS Mapping
		Activity 4.2.2 Develop standards and compliance requirements for pig pens and effluent disposal
		Activity 4.2.3 Install tanks for piggery effluent collection and undertake appropriate training
		Activity 4.2.4 Develop piggery effluent management plan/program
		Activity 4.2.5 Facilitating plan uptake through training and awareness raising
Output 4.3 Improved storm water/off-road drainage to reduce risk of coastal pollution		Activity 4.3.1 Assess the current storm water drain system(s) and identify vulnerable and high build-up of sediment areas
		Activity 4.3.2 Identify and carry out solution to remove or reduce build up of sediments if road run-offs on the coastal road, and thus reduce runoffs seeping down to the reef
COMPONENT 5: Improved water supply management to reduce peak demands and risk of saline up-coning		
Output 5.1 Reduced Peak Demand Abstraction Rate		Activity 5.1.1 (Purchase and install water meters at each water bore and storage tank) Investigate implement full system water loss management SOPAC/PWD at Paliati/Tuila Area, through installation of households water meter-Replication from Fualahi Households metering under SOPAC/PWD
		Activity 5.1.2 Develop database in form of GIS on water abstraction for each bore, sustainable yield, pump efficiencies, pump logs to strengthen SOPAC&PWD System Loss Management Plan
		Activity 5.1.3 Develop database in a form of GIS on each storage tanks, effective storage, step test, area of coverage, demand and link with System Loss Management Plan and Niue Drinking Water Safety Plan (SOPAC/PWD).
		Activity 5.1.4 Purchase materials for the construction of a new storage water tank.
		Activity 5.1.5 Construct new storage water tank at Fou, Alofi North
		Activity 5.1.6 Conduct public awareness on water usage and water wastage conservation measures (refer component 6)
Output 5.2 Reduced volume of water leakage in the Water Supply System and Households level.		Activity 5.2.1 Strengthen and implement recommendation in SOPAC/PWD Water Demand-System Loss Management Plan for Tapeu-Alofi South and Paliati-Alofi North

	Activity 5.2.2 Conduct a survey to identify water leakages in the Alofi area (households, pipes and tank overflows)
	Activity 5.2.3 Develop a leak reduction program based on the survey findings
	Activity 5.2.4 Undertake repairs on pipe leakages based on the leak reduction program
	Activity 5.2.5 Investigate and implement best option to stop storage tanks overflows
	Activity 5.2.6 Procurement of underground pipe locator for GIS purpose of mapping Alofi water supply system for Village Water Plan
	Activity 5.2.7 Conduct public awareness and training on household water leakage and water conservation measures
Component 6:	
Improved water resource management measures	
Output 6.1 Comprehensive Water Bore Analysis and Monitoring Program	Activity 6.1.1 Install at least 6 multi-level piezometer nests for the monitoring of freshwater lens thickness, water level and salinity responses to recharge, abstraction, tidal and other influences
	Activity 6.1.2 Install multi-level piezometer nests
	Activity 6.1.3 Procure and deploy groundwater monitoring probes for Alofi wellfield Piezometer nest
	Activity 6.1.4 Develop a water bore analysis and monitoring program on Multi level piezometer nest
	Activity 6.1.5 Conduct periodic water bore analysis on the Multi level piezometer nest as required under the monitoring program and document results in report form
	Activity 6.1.6 Undertake groundwater assessment study on Alofi Well-field for Alofi Water Resource Management Plan
	Activity 6.1.7 Assessment infrastructure requirements to strengthen institution capacity on rainfall data, drought analysis and interpretation , etc





Output 6.2 Information on Production Bore Yield established.	Activity 6.2.1 Develop a production bore yield test program on existing bore pumps for its efficiencies
	Activity 6.2.2 Determine and/or establish baseline data on production bore yield for the Alofi area and set up database on all pumps
	Activity 6.2.3 Conduct six-monthly production bore yield tests as required by the program developed under 4.2.1.
	Activity 6.2.4 Document and disseminate results of the yield tests.
	Activity 6.2.5 Develop Water Quality testing program for all bore pumps for any likely contaminants
Output 6.3 Comprehensive Water Quality Monitoring System	Activity 6.3.1 Undertake independent review Water Laboratory to verify accreditation and carryout recommended remedial actions
	Activity 6.3.2 Investigate and establish relationship with international laboratory(s) in NZ for more comprehensive water quality testing and analysis
	Activity 6.3.3 Determine baseline data of water quality of Alofi area water supply system
	Activity 6.3.4 Develop water quality monitoring program for Alofi area (biological and chemical)
	Activity 6.3.5 Explore and introduce of H2S Test Kit for Alofi community (one per household)
	Activity 6.3.6 Conduct monthly water quality tests for Alofi Water supply system
	Activity 6.3.7 Develop appropriate parameters for coastal water quality monitoring
	Activity 6.3.8 Collect samples for external testing and analysis
	Activity 6.3.9 Conduct public awareness (refer component 6)
	Activity 6.3.10 Conduct assessment on coastal spring cave water, characteristics and linkages to water lens and coastal water
Output 6.4 Improved Protection for Boreholes	Activity 6.4.1 Assess the status of borehole headworks and identify appropriate remedial actions to improve protection of borehole from local pollution and contamination highlight in the Niue Drinking Water Safety Plan Improvements Schedule
	Activity 6.4.2 Develop costing for recommended remedial action and procure materials as required.
	Activity 6.4.3 Carry out improvements for/on all boreholes headworks
	Activity 6.4.4 Assess the status of all tanks sites headworks and identify appropriate intervention / actions to improve protection on Drinking water storage in all Public Water Tanks in Alofi-highlight in the Niue Drinking Water Safety Plan Improvements Schedule
	Activity 6.4.5 Develop costing for recommended remedial action and procure materials as required.
	Activity 6.4.6 Carry out improvements for/on all Water Tanks headwork's
Component 7 Communication, Education and Awareness Program	
Output 7.1 Improved understanding and awareness on water, the threats and the policy environment.	Activity 7.1.1 Establish a Communication and Awareness Group
	Activity 7.1.2 Develop a Communication and Awareness Strategy for NWC
	Activity 7.1.3 Implement Communication and Awareness Strategy, incorporating activities highlighted in components 1 - 5 above
	Activity 7.1.4 Demonstrate improved community capacity, awareness and engagement in water use efficiency and water management
	Activity 7.1.5 Increase sectoral engagement in formal multilateral communication on water issues
Component 8 Delivery of the Niue GEF IWRM Demonstration Project	
Output 8.1 Successfully managed project	Activity 8.1.1 Establish Project Management Unit
	Activity 8.1.2 Establish and support the National Water Steering Committee (NWSC), incorporating cross-sector, government, civil organisational, private sector and community representatives responsible for delivering the project, with public accountability
	Activity 8.1.3 Attend regional meetings and workshops/training on IWRM matters
	Activity 8.1.4 Develop and implement Replication Strategy
	Activity 8.1.5 Develop and implement Communication Strategy
	Activity 8.1.6 Develop and implement Capacity Building Strategy
	Activity 8.1.7 Develop and implement Engagement Strategy
	Activity 8.1.8 Manage budgets, deliverables and timelines
	Activity 8.1.9 Source additional funding to add value to project outcomes
	Activity 8.1.10 Complete reporting commitments

The project goal was the sustainable protection and management of Niue's groundwater resources and reef fishery for improved and sustainable livelihoods, ecosystems and environment. The main objective was to develop an integrated resource management system that protects the groundwater aquifer from contamination and improves water resources management by users through the following key outcomes:

- On-going sound, integrated and transparent governance of Niue's water resource
- Water Legislation, Policy and Planning measures
- Improved Management of hazardous and waste products to reduce risks of ground water contamination
- Improved management of non-household chemicals, effluents and fuels
- Improved water supply management to reduce peak demands and risk of saline up-coning
- Improved water resource management measures
- Implement an Education and Awareness Program

The project focus was mainly on building national capacity in IWRM and demonstrating stress reduction measures that complement national priority economic development through national planning and coordination of national water resource strategies for a sustainable way forward in protecting and managing our water resources. This was achieved by evaluating and acting on potential threats that were not properly coordinated and handled nationally. One of the main focus was on legislation and much effort was directed into to getting this endorsed by the national government to ensure that the groundwater is protected though an integrated approach.

In the ground activities were focused on improving waste oil storage as it was found to be a high potential risk to the groundwater and ensuring water security. Water security was addressed through building new water tanks for the communities and repairing leaks to maintain the continuous supply of safe drinking water to around Niue and the development of water quality monitoring program. Provided technical support to various sectors in water and sanitation issues including seeking political support and awareness campaigns throughout the island. The following table highlights the top 3 key results from the project, a full National Results Notes can be found in Annex 5 that highlights results that link to key performance indicators.

Key Results
1. Enactment of the Niue Water Act, providing a framework for water allocation and water resource protection management
2. Establishment and implementation of National and Village Drinking Water Safety Plans to provide safe drinking water to all central areas in Niue.
3. On the ground works to improve Niue's water security, by reducing water loss through leakage and increasing water storage.



5.2.1 Co-financing

The outcome of rebuilding as a result of cyclone Heta and the national government focus on the economic development in tourism sector, improvement of its essential key infrastructure see the level of financial support towards the implementations of water programs. This also in-line with the National Drinking Water Safety Plan and Infrastructure Plan which run in parallel with the national demonstration project.

The co-funding also including various regional water programs implemented prior to the project which end while this project continues. The table below shows the additional in-kind and cash (NZD) co-financing raised during the life of the project.

Source	Amount (USD)	Cash or In-kind	Description
Government	96,000	Cash	Project Manager \$2000/month
Government	19,000	In-kind	Groundwater and coastal water quality analysis equipment
Government	10,000	In-kind	Piggery fencing, effluent treatment beds, solid waste composting facility at landfill for piggery effluent management
Government	5,000	In-kind	Oil interceptors, curbing, drains and pipework for road run-off management (oil interceptors)
Government	3,000	In-kind	7 water storage tanks to reduce peak demand abstraction rates
Government	15,000	In-kind	Leakage reduction surveys, repairs, bulk meter usage as part of leakage reduction programme
EU-SOPAC IWRM	5,000	Cash	Technical and community support for education and community awareness
EU-SOPAC HYCOS	20,000	Cash	Groundwater and coastal water quality analysis equipment
EU-SOPAC HYCOS	20,000	Cash	Observation borehole drilling and analysis
EU-SOPAC HYCOS	20,000	Cash	Bore tests and analysis
NZAID-SOPAC WOM	5,000	Cash	Groundwater and coastal water quality analysis equipment
NZAID-SOPAC WOM	25,000	Cash	Land and marine monitoring, surveys and analysis
NZAID-SOPAC WDM	5,000	Cash	Computer modelling equipment and software
NZAID-SOPAC WDM	30,000	Cash	Data loggers, transducers, listening sticks, flow meters for leakage detection
NZAID-SOPAC WDM	5,000	Cash	Publishing and printing
NZAID-SOPAC WDM	25,000	Cash	Leakage reduction surveys, repairs, bulk meter usage as part of leakage reduction programme
NZAID-SOPAC WDM	5,000	Cash	Community engagement activities/Conservation and awareness campaign
NZAID	150,000	Cash	Oil interceptors, curbing, drains and pipework for road run-off management (oil interceptors)
NZAID	100,000	Cash	6 water storage tanks to reduce peak demand abstraction rates
UNDP TRAC	100,000	Cash	New tanks, effluent treatment for septic tank improvements
UNDP TRAC	50,000	Cash	Collection bins, composting for solid waste improvements
UNDP TRAC	1,000,000	Cash	Cement bunds, tanks, pads for fuel oil storage improvements
UNDP TRAC	5,000	Cash	Waste separation and security for hazardous waste improvements
UNESCO	15,000	Cash	Technical and legal support to review and update relevant national legislation
FAO	50,000	Cash	Cement bunds, tanks, sheds, stores, applications, disposal as part of agro-chemical storage and usage
FAO	25,000	Cash	Piggery fencing, effluent treatment beds, solid waste composting facility at landfill for piggery effluent management
FAO	25,000	Cash	Irrigation efficiency systems and crop trials
Government of Venezuela	25,000	Cash	Piggery fencing, effluent treatment beds, solid waste composting facility at landfill for piggery effluent management
Government of Venezuela	25,000	Cash	Composting and leaching trials, crop quality studies as part of fish processing facility effluent waste usage
Government of Venezuela	40,000	Cash	Irrigation efficiency systems and crop trials
	2,139,000		

5.3 Participatory Planning, Monitoring and Evaluation

The NWSC was the recognised body for Monitoring and Evaluation for the duration of the project. This body consist of all relevant key stakeholder to all national water and sanitation project. Further monitoring and evaluation was conducted by the government office responsible to the implementing agency as normal procedures in advising the cabinet ministers. The project participatory monitoring and evaluation plan can be found in Annex 7.

Project annual auditing outcome report was undertaken by a regional auditing consulting firm every year. This was tabled at NWSC meetings for discussion and further recommended actions to be undertaken through the PMU.

The NWSC responsibilities for PM&E are stipulated in the Water Act 2012, Regulation 2013, Part 2 Committee Composition and Functions, clause 6,

“To monitor and evaluate all National Water Projects to ensure that the projects follow the national plan, objectives of the Act and project objectives”





6. Strengthening National Coordination and IWRM Policy and Planning in Niue

6.1 Linkages of Demonstration Activities with IWRM Planning

The national demonstration project provided opportunities that supported the national water planning process. This through undertaking activities and at the same time participating at the various nation projects consultation and national gatherings. Through the IWRM initiated development of Village Water Management Plans, a communication pathway was established between community and cabinet, and provided a mechanism for the community to communicate with the government about their needs and priorities for IWRM planning.

The resources leveraged from the RCPU helped the implementing agencies to showcase integration at work in Niue, how working together can be done. The enactment of the Water Act 2012 helped develop the roadmap in coordinating some of the key issues that required incorporating into the water planning and policies.

The outcome of the project in relation to the national policy shows there are some key areas that still need to be worked, though this has been identified, it may take some time to see the results of the actual work. To maintain the support for and capacity in national water planning, the government supports the IWRM implementing agencies request to sustain financial support for key staff and thus ensure future planning activities take place. The key to continued effective water resource management is to secure the position to coordinate and oversee national policy matters.

6.2 Improving National Coordination for IWRM

National coordination for IWRM in Niue has been progressing but there is still a lot of reforming process that needs to be considered at a national level in order to strengthen functions and coordination.

There are a few main obstacles that must be addressed to improve national coordination of IWRM. The level of human resource available, commitment levels of staff and the implementing agency is often limited by sheer lack of people. Culture also plays a limiting role in Niue as new corporate concepts and models take time to be accepted and adopted into cultural practice. This leads into the capacity building required. With a small population it is important that the people who can be leaders in coordination are supported regionally and nationally to implement IWRM activities and there is sharing of experiences around the region.

Sustainable financial mechanisms are another driving factor to ensure and enable IWRM concerns. Secure finances that are well coordinated will get the recommendations implemented on the ground that in turn sustain and improve the level of coordination required.

With formulation of the NWSC and other activities the IWRM paved the way for integrated coordination in Niue. There is now an open opportunity to maintain this level of coordination nationally and ensure that all necessary steps are undertaken to protect the welfare and the health our people.

6.3 National IWRM Planning

The timing of this project coincided with the Niue National Strategic Plan (NNSP), the strategic action plan for Niue. It is important that IWRM complements the NNSP as it is important for the activities and national priority to be linked to maximise the benefits, particularly as Niue has limited funds to share around all necessary activities. In order for Niue to maintain strength in its planning it is important that water and sanitation issues are developed in a simple way and well understood by key stakeholders.



7. Capturing Lessons Learned for Replication and Scaling-up of IWRM Best Practice in Niue



8. Planning the Transition from IWRM to the Regional Ridge to Reef Initiative

8.1 Scaling-Up to broader Integrated Land, Water and Coastal Management

The priority actions for IWRM in Niue are to endorse the Masterplan and identify budget sources for implementation leading up to the Donor Roundtable in December 2013. In the meantime, the priority actions for the IWRM Demonstration project are for the IWRM Project Manager to collect the final results from the septic trials, continue to raise awareness raising through community outreach, ongoing monitoring and public forums such as international events, as well as continue working with CIE Environment Unit and PAD to replicate and upscale the demonstration activities.

The transition to a Ridge to Reef approach has been discussed with CIE, the Water unit and the PSC. The concept has been embraced as a conduit to Niue's national goals of taking a more integrated approach to natural resource management through integrating management of groundwater and coastal pollution. The NSDS, NWSHP, NWSHIP and Masterplan all clearly make this link. The next steps are to broaden governance structures, through focussed technical working groups or plenary's such as the PSC. Embracing a holistic approach has already started within CIE who now host climate change, biodiversity, water and sanitation, and sustainable land management programmes.

With sanitation being a critical element in both using scarce water supplies and in the contamination of groundwater and coastal waters, It was considered essential that sanitation issues be addressed in the Masterplan. The R2R approach also embraces this approach, and given that other donors are now better placed to take the results of the IWRM

Demonstration Project and execute larger-scale infrastructure projects of this nature, the suggestion for the next phase is for the IW concept to move beyond piloting sustainable options for household sanitation. It moves to the next step of the waste treatment process, which is disposing and treating outflow. The focus will change to what happens after the sewerage is pumped out of the septic tank. It increases the scope of the first Demonstration to also include broader coastal, marine health and waste disposal issues on Niue.

The approach further expands the IW scope from households and schools, to also include waste from government buildings, restaurants, hotels, the Refugee Processing Centre (RPC) and other private sector businesses. This proposal adds value by recycling water for irrigation and creating compost that can be used for increased food security.

There is also the opportunity to broaden the waste management scope of this project by reviewing pollutants from dumping of waste at the two dumps on Niue (one for RPC and one for local disposal of waste). Both dumps are unlined and toxins leach into the ground water table. The dumps need to be reviewed, rationalised, lined and ponds created for tertiary treatment. The same pond could also be used for the disposal of septic waste.

In close collaboration with the Ministry of Fisheries, Health, land management and biodiversity programmes, a programme of desk reviews and field studies can establish baselines, identify technology options, system design, awareness raising, capacity building, regulatory frameworks, construction, distribution and on-going monitoring for establishing a feasible national waste management system for Niue. For more details on the proposed concept see the logframe in Annex 9.



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Annex 1: Niue National Water Steering Committee

Chairperson
Director for Public Works
Deve Talagi
Phone:
Email:



Vice Chairperson
Director for Environment
Name: Sauni Tongatule
Phone:
Email:
Sauni.Tongatule@mail.gov.nu



Public Health Officer, Water Quality
Name: Grizelda Mokoia
Phone: 00638 4100
Email:
Grizelda.Mokoia@mail.gov.nu



Director for Met Office, climate change
Name: Sionetasi Pulehetoa (Mr)
Phone:
Email:



Director for Community Affairs
Name: Gaylene Tasmania (Mrs)
Phone: 00 683 4018
Email:



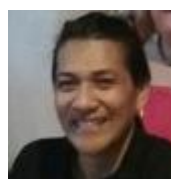
Director of DAFF
Name: Brendon Pasisi (Mr)
Phone:
Email:



President Chamber of Commerce
Name: Elliot Kirton (Mr)
Phone:
Email: chamber@niue.nu



Financial Secretary/Donor Project Officer
Name: Doreen Siataga (Mrs)
Phone:
Email:
Doreen.Siataga@mail.gov.nu



Water Operational Advisor
Name: Clinton Chapman (Mr)
Phone: 00 683 4137
Email: Clinton.Chapman@mail.gov.nu



Water Supply Manager
Name: Andre Siohane (Mr)
Phone: 00 683 4137
Email: Andre.Siohane@mail.gov.nu





Annex 2: National Water Steering Committee ToR

The Niue Water Steering Committee is the base to ensure a strategic, continuous and adaptive approach to the national management of water. Niue Water Steering Committee will assist Niue to build on lessons learned, replication and to work in a targeted way so ensures the sustainable use and protection of national water resources as the foundation for human health, economic development and a productive environment.

Niue Water Steering Committee's objective is to lead water as a national priority, strengthening transparency and coordination within government and non government sectors, including global linkages, formulating government goals and policies, strengthening access to resource water management and addressing issues related to climate change adaptation.

Functions

The Niue Water Steering Committee generally involves these main functions:

1. To facilitate the Integrated Water Resource Management (IWRM) project and Pacific Adaptation to Climate Change (PACC) project in Niue.
2. To prepare an overarching national action agenda for sustainable water resources management that addresses priority issues from formulating sound policies and laws, facilitate the coordination of policy implementation, building institutional capacity, and managing all the information generated in the planning, management and reform process;
3. To guide and coordinate water resource planning, management and reform processes with the help of overarching work plans and frameworks for action, so that the results are consistent with the agreed expectations;
4. To facilitate dialogue between government, non-governmental and external actors for input, support and contributions to joint, strategic and coordinated action to strengthen water resource management.
4. Niue Water Steering Committee has a technical advisory role on the level of directors and senior representatives of government departments. Technical recommendation and project implementation can be prepared from the Niue Water Steering Committee to assist guide other national committees or councils, Cabinet decisions and also that of the Niue Parliament Assembly.

Administrative functions

- Chairmanship shall be the Water Lead Agency that of the Director of Public Works Department and Vice Chairperson shall be the Director for Environment the National GEF Focal Point. Rotation to the role of Chair, Vice-Chair and Secretariat can be distributed between departments when necessarily required;
- Niue Water Steering Committee is inter-departmental linked with that of civil society which members are officially endorsed by Cabinet (Cabinet Minutes, Annex 1)
- Niue Water Steering Committee serves as the principal source of reporting and information disseminating concerning available country resources for all aspects of water project implementation such as the Niue Strategic Plan, cooperate plans, commercial strategic plans, project work plans and legislations;
- Be informed of regional steering committee meetings and other meetings relevant to overall regional project implementation, including regional activities conducted through the regional project management units and agencies in partnerships;

- Provide input to the Regional Steering Committee for strategic policy guidance for the implementation of the project, as well as guidance to implement national components of the demonstration projects;
- Facilitate national policy and institutional changes necessary to engender success in implementing project activities.
- Niue Water Steering Committee can form coordinating sub-committees that of technical advisers from relevant government sectors as well as project site/s working groups to coordinate and implement project activities.
- The Niue Water Steering Committee may invite other sectors when necessary to address issues of relevance to effectively execute the water projects.
- Meetings can take effect in schedules from the committee and secretariat with the presences of the 4 core members representing the Director for Public Works, Water Manager, Public Health and Department of Environment.

Resources and financial administration

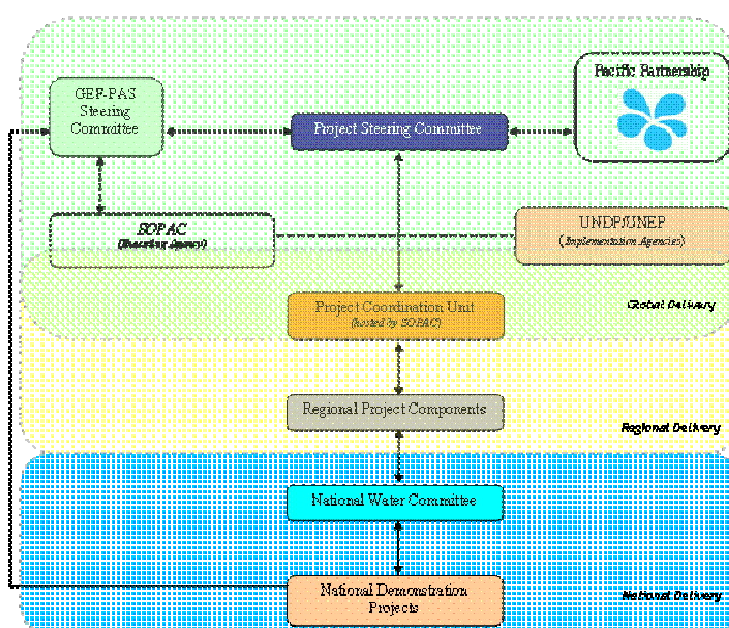
Niue Water Steering Committee will be supported from involving programs to ensure efficiency in its performances and deliverances.

Niue Water Steering Committee

Niue Water Steering Committee will serve as the IWRM and PACC committee (Identified in a special meeting held on 22nd May 2009). (Cabinet endorsements see Annex 1)

1. Director for Public Works, Chairperson
2. Director for Environment, Vice Chairperson
3. Public Health Officer, Water Quality
4. Director for Met Office, climate change
5. Director for Community Affairs
6. Director of DAFF
7. Manager Water Supply
8. Water Operation Advisor
9. President for Chamber of Commerce
10. Treasury Donor Projects Officer

Niue Water Steering Committee Governance Structure



Timeline

This Term of Reference shall be reviewed from time to time including the functions and members of the Niue Water Steering Committee.



Annex 3: Stakeholder Analysis and Engagement Action Plan

Project Goal
Sustainable protection and management of Niue groundwater resources and reef fishery for improved and sustainable livelihoods, ecosystems and environment
Project Objective
To develop an integrated resource management system that protects the groundwater aquifer from contamination and improves water resources management by users

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
	COMPONENT 1: Ongoing sound, integrated, transparent governance of Niue's water resource	Establishment of an ongoing National Water Council (NWC) with public accountability	Cabinet endorsement of NWC	Political will and lack of enabling environment	Health – Environment-PWD and PMU
1.1	Output 1.1: National Water Council (NWC) Established	Establishment of NWC	Cabinet endorsement of NWC	Political will and lack of enabling environment	Health – Environment-PWD and PMU
	<i>Indicative Activities</i>				
1.1.1	Develop governance framework for ongoing NWC, including Terms of Reference, roles and responsibilities and legislative and institutional links	Terms of Reference Roles and Responsibilities identified, including Agency roles and responsibilities	Cabinet endorsement	Political resistance to proposed governance structures; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy	National PMU
1.1.2	Secure sustainable financing (and institutional home) of NWC, Management Plans and other Project Outputs	Options assessment report Sustainable funding mechanisms endorsed by Cabinet Budget line attributable to IWRM and WUE	NWSC endorsement Cabinet endorsement and/or National budget	Political resistance to sustainable funding options. Potential politics of Agencies	National PMU- Treasury and Cabinet
1.1.3	Develop support structure for NWC, including an executive capacity and working groups (technical and village)	Executive support appointed and finance in place	NWSC endorsement Director endorsement	Capacity to attract and retain suitable candidates; Government agency support	Environment and Public Health-DJLS and GEF-IWRM
1.1.4	Establish NWC	Appointment of NWC members	Cabinet endorsement of NWC	Capacity to attract and retain suitable candidates	Health – Environment-PWD and PMU
1.1.5	Raise awareness and develop skills of NWC	Project Monitoring and Evaluation framework for NWC	Cabinet endorsement	NWSC members can be retained	Environment and Public Health-DJLS and GEF-IWRM



Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
	Component 2: Water Legislation, Policy and Planning measures				
2.1	Output 2.1: Review and update relevant national legislation	Review Draft National WR Bill and Regulations an Enact	Link National WR Act into National IWRM Framework	Implement the Act to protect the Niue's source of water supply	EU IWRM NWSC Crown Law Environment-Health
	Indicative Activities				
2.1.1	Finalise Water Resource Bill linkage to IWRM Plan and NWC Functions and submit for enactment	Enactment of the Water Resource Bill	Water Resource Management Act, Progress report	Cabinet will endorse Bill and Assembly pass the Bill.	PWD - Water Supply, NWSC; EU IWRM
2.1.2	Establish a Water and Resource Policy Advisory Group to strengthen capacity on water policy and enforcement requirements	Increased awareness and understanding on water policy; increased compliance on regulations due to greater understanding and appreciation of the threats of contaminants for the under ground water.	Advisory Group minutes of meeting and delivered work plan; Progress report	Members effectively participate in the Advisory Group and membership is balanced with EU IWRM Support.	PWD - Water Supply, NWSC -PMU
2.1.3	Undertake at least 3 national capacity building workshops on water and resource policies.	Increased awareness and understanding on water policy within government, commerce and civil society	Workshop report(s) endorsed by NWSC, Financial statement, Progress report	Materials presented are balanced and easy to understand by all participants; externally funded so dependent upon co-funding body priorities, resources, etc.	PWD - Water Supply, NWSC-PMU
2.1.3	Investigate feasibility of an over-arching legislation for Niue natural resources, incorporating IWRM and climate change mitigation	Report completed and recommendation adopted	Report, Legislation endorsed by Cabinet	Personnel availability and consultant identified; political will; externally funded so dependent upon co-funding body priorities, resources, etc	PWD - Water Supply, NWSC; PMU-Policy Advisory Grp
2.1.4	Review and update relevant legislations to incorporate IWRM principles, in particular the water resource, access, usage and mitigating climate change impacts on water resources.	Review completed and endorsed by NWSC	Enactment of the Water Resource Management Bill, Progress reports	Cabinet will approve the Water Resource Management Bill and approved by the Niue Assembly; externally funded so dependent upon co-funding body priorities, resources, etc	PWD - Water Supply, NWSC-Policy Advisory Group
2.1.5	Develop policy measures and regulations as stipulated in the Water Act 2012	Policy measures and/or regulations drafted and approved by Cabinet	Progress reports, Cabinet Minute, Draft regulations and policy measures	Cabinet will approve the policy measures and proposed regulations.	PWD - Water Supply, NWSC-Policy Advisory Group
2.1.6	Develop groundwater protection zones (GPZ) for Alofi Catchment, with the view of developing a land-use plan	Groundwater Catchment Protection Zones established and accepted by Alofi community	Signage, guidelines and maps showing the Groundwater Protection Zones	Alofi community support ground protection zones; Community understand and support the concept of land use planning	PWD - Water Supply, NWSC, Policy Advisory Grp Alofi Community

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
2.1.7	Draft regulations to guide the granting of licenses for abstracting water	Regulations established and endorsed by Cabinet.	cabinet minute, progress report	Policy and technical capacity - to draft sound regulations	PWD - Water Supply, NWSC-Policy Advisory Grp
2.1.8	Develop and conduct education and awareness on legislations, regulations, policies with some emphasis on enforcement. (refer to Component 6)	Improved awareness on water and related legislation, policy and regulations; improve compliance.	Workshop report(s) endorsed by NWSC, Financial statement, Progress report	Participants apply their newly found knowledge and understand to improve compliance particularly areas where limited enforcement have been applied.	Communication and awareness grp, NWSC
2.1.9	Develop Village Water Management Plan	Completion of Village Water Management Plan	Progress report, village water management plan endorsed by village and NWSC	Effective participation by community in developing water management plan for the village. Policy and technical capacity is available to support plan development	NWSC, Alofi Community
2.2.10	Niue Long-term Sustainable Integrated National Resource Management Strategies	Formulation of NWSC and act as a sustainable management technical advisory body of Niue Water Resource Management to Cabinet Ministers	NWSC members and TOR be included in the WR Bill as and legislated body of WR decision making	Members are from different sectors NGO Social Society _NGO and Government Organisation	HealthEnvironmentP PWD private Sector Cabinet
2.2.11	Develop Niue Water and Sanitation Indicators Framework	Complete of Niue Water and Sanitation Indicators Framework	Consultancy TOR included National Consultation workshops NWSC and NPMU endorsed Cabinet Endorsement	Effective participation by government and private sector including communities Policies and technical capacity is available to support plan developments	PWD NPMU – Consultancy Govt & Private Sectors
2.2.12	Develop National Communities Water Framework for GEF Small Grants programs support	Complete National communities Water Framework for GEF Small Grant Program Support	Consultancy TOR Communities Consultation Workshop	Members are from different sectors NGO Social Society _NGO and Government Organisation Policies and technical capacity is available to support plan developments	PWD/ NPMU Environment Village Councils
2.2.13	Develop Niue National IWRM Action Plan and Costed IWRM Action Plan	Complete Niue IWRM Action Plan and Costed IWRM Action Plan	Review exiting water plans including sanitation and findings under IWRM Demo National Consultation Workshop	Policies and technical capacity is available to support plan developments Policies and technical capacity is available to support plan developments	NPMU and Government Departments Cabinet
2.2.14	Develop National IWRM Overarching Strategic Policy Statement for Water and Sanitation	Complete National IWRM Overarching Strategic Policy Statement for Water and Sanitation	Review exiting water plans including sanitation National Consultation Workshop	Policies and technical capacity is available to support plan developments	NPMU and Government Departments Cabinet



Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
2.2.15	Develop National WUE Plan	Complete national WUE Plan	Review National Water system Loss management and conduct sector review of system for development WUE Plan Cabinet endorsed plan	Technical Capacity and Data available to support plan development	PMU and Government Sectors and Cabinet
	COMPONENT 3: Improved Management of hazardous and waste products to reduce risks of ground water contamination				
3.1	Output 3.1: Improved compliance of septic tanks as per approved effluent standards	Improve effluent discharge of all Septic tanks in catchment area	Septic tanks around catchment area meet standard	Risks on Groundwater contamination is reduce or minimised	Health – Environment-PWD and PMU
	<i>Indicative Activities</i>				
3.1.1	Conduct inventory of septic tank compliance	Baseline data available on number of septic tanks and types, for all private households, commercial accommodations, businesses, and GON buildings; Inventory Report including GIS Mapping.	Public Health Inspections Report(s), Inventory Report supported by GIS, Progress reports	Task is relatively straight forward and permission provided for the inventory to take place.	Environment and Public Health-DJLS and GEF-IWRM
3.1.2	Review Niue Building Code effluent requirement and investigate option of developing standards for each zones (based on distance from water bore)	All new private houses, commercial buildings and Government buildings located at the catchment area should have a proper septic tank; Septic Effluent Standards for each zone are developed	Progress reports, establishment and approval of effluent standards for Alofi based on vulnerability to threats	Effective building inspection program in place; personnel and equipment available	PWD, NWSC
3.1.3	Carry out remedial actions and maintenance to reduce risk of septic overflow for dwellings/households located with the water catchment area (Kaimiti, Fualahi, Tuila and Toa areas).	Improved septic tank system for households located within water catchment area.	Progress reports, financial statements	Personnel and equipment available; householders supportive of process	Water Supply – PWD-
3.1.4	Conduct feasibility assessment of the current septic waste open landfill, and investigate appropriate long term solution	Feasibility Assessment report completed with long term solution for disposal of liquid waste identified.	Feasibility Assessment report, Progress report	Suitably qualified experts available to undertake assessment	Water Supply - PWD, Environment, NWSC
3.1.5	Develop guidelines for septic waste removal program and implement accordingly	Alofi community adopt and participate in the systematic septic waste removal program	Septic truck log book, Progress report	Septic truck available and operational	

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
3.1.6	Conduct public awareness consultations on groundwater protection and threats of contaminations and septic maintenance - Refer component 6	Public meetings, awareness activities, media advertisements	financial statement, progress reports	Effective participation at the public awareness consultations.	Communication and Awareness Group = NWSC
3.2	Output 3.2: Improve management of handling and disposal of domestic solid waste from households	Support Community and household with awareness on impact of waste to groundwater	Waste disposal away from catchment areas	Households awareness on groundwater vulnerability from waste disposal	Health Environment IWRM PMU Community
	Indicative Activities				
3.2.1	Conduct situation analysis of appropriate disposal practices through consultation with Alofi District Community	Analytical findings of appropriate disposal practices of households and businesses and proposed recommendations in Alofi District	Study report approved by NWSC	Good representation of people attending the community consultation(s).	Environment, NWSC
3.2.2	Conduct participatory planning of household handling and separation system.	A work plan of handling and separation system in Alofi District households.	Progress reports	Good representation of people attending the public consultation(s). Discuss with community best effective option / method to undertake	Environment, NWSC
3.2.3	Conduct feasibility study on establishing a Recycling Facility	Feasibility study completed.	Submit Report to NWSC and to Cabinet for endorsement	Partnership arrangement is secured for the waste management program	Environment, NWSC
3.2.4	Introduce and implement simple and practical methods to separate household/domestic waste for composting, recycle, and disposed at landfill	Domestic solid wastes are separated, collected and disposed according to agreed and work plan	Progress reports	Households actively participates in the programme; Collection bins are provided as part of the project, including training on collection and separation of waste for compost and/or recycling.	Environment, NWSC, DAFF
3.2.5	Implement recommendations Recycling Facility feasibility study and Construct medium scale recycling facility	Recycling facility operations developed and operated	Operation programs reported	Risks of funding secure for the construction and operations including human resources	Environment-NWSC
3.3	Output 3.3: Establishment of fuel and oil storage standards to reduce risk of groundwater contamination	Reduce threats of groundwater contamination from Fuel and waste oil storage	Appropriate measures in place for all responsible organisation	Awareness raising on groundwater vulnerability from fuel and waste oil contamination	NWSC –IWRM PMU and Niue Power-Bulk Fuel
	Indicative Activities				
3.3.1	Conduct inventory of oil and fuel storage locations and risks in consultation with site managers/owners.	Oil and fuel imports and storage from Bulk Fuel, Niue Power and bowzers.	Inventory report, Progress Report	Stakeholders willingly participate and exercise is relatively straight forward	NWSC- PMU



Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
3.3.2	Address waste oil storage concerns by purchasing tanktainer(s) to store for final disposal, including constructing proper area for the tanktainer(s)/storage	Proportion of waste oil stored in a proper area in tanktainer and proper storage facility All waste oil is collected and stored	Financial Statement, Progress report	Current arrangements not feasible and carry high threats for the water lens. .	NWSC (assisted by Niue Power and Bulk Fuel)
3.3.3	Develop guidelines and/or standards for fuel and oil storage, including waste oil for Niue Power, Niue Bulk Fuel and private operators.	Guideline/standards on fuel and oil storage including waste oil	Guideline/Standards approved by Cabinet	Develop practical, affordable standards that adequately mitigate risks	NWSC (assisted by Niue Power and Bulk Fuel)
3.3.4	Facilitating guideline uptake through training and awareness raising	All fuel and waste oil storage facilities adopt the guidelines and standards for safe storage	Audit of fuel and waste storage facilities	All operators will adopt the standards/guidelines for the storing of fuel, oil and waste oil.	
3.3.5	Develop fuel and oil leak monitoring systems (in consultation with Niue Bulk Fuel General Manager and Niue Power General manager) supported by regulations	Organisation report with a certain degree of accuracy of the amount of fuel and waste oil spillage per month	Spillage reports, Progress report	Implementing partners (Niue Power and Bulk Fuel) undertake monitoring of leakages and report accordingly.	NWSC (assisted by Niue Power and Bulk Fuel)
3.3.6	Protection measures through construct concrete bund for Aviation fuel storage at Airport (Bulk Fuel)	Complete construction of concrete bund reduce risks of contamination from spillage	Activity completion report	Safe storage area for hazardous waste in catchment area	PM, Bulk Fuel and Privet Sector
3.4	Output 3.4: Improve Management of handling and disposal of hospital hazardous waste.	Proper hazardous waste management in place for Niue Fooo Hospital	Procedure and guidelines are followed	Risk of groundwater contamination is reduce by follow proper disposal procedure	Health-Environment –PMU and NWSC
	Indicative Activities				
3.4.1	Assess all current hospital waste disposal system/arrangements and risks	Baseline data on amounts and types of hospital waste in a month	Report to the NWSC; project progress report	All waste disposed are recorded.	Health - Environment, NWSC, PMU
3.4.2	Develop a hospital hazardous waste management and disposal plan	Completion and implementation of the hospital hazardous waste management and disposal plan	Report to the NWSC; project progress report	Hospital staff willing adopt and implement hazardous waste management plan.	Health - Environment, NWSC
3.4.3	Develop database as a monitoring system for the disposal of all hospital hazardous waste by type of hazardous waste and form of disposal.	Baseline data on amounts and types of medicine, consumables equipments and materials, usage, and dispose; and form of disposal.	Annual Report to the NWSC; project progress report	Sufficient expertise and resources are available to develop and populate the database	Health - Environment, NWSC
3.4.4	Conduct in-house training of hospital staff on hazardous waste management and disposal requirements/practices.	Increase awareness of hazardous wastes and disposal practices	Report to the NWSC; project progress report	All staff attended and received training.	Health - Environment, NWSC, Communication and awareness group

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
	Component 4: Improved management of non-household chemicals, effluents and fuels				
4.1	Output 4.1: Incorporation of Standards and Compliance Requirements for Agro-chemical storage	Standards of Safe storage re in-place	Agro-chemicals storage are safe and sound	Protection measures are follow and compliance with standard with public awareness	PMU_NWSC – Private Sectors and Community
	Indicative Activities				
4.1.1	Conduct inventory of agro-chemical storage facilities including outlets sell agro-chemicals	Baseline data on agro-chemicals imports, storage and sales	Inventory report, progress report	Private Sector willing to participate in the inventory	DAFF, NWSC
4.1.2	Develop guideline and/or standards for agro-chemical storage facilities including private operators within Alofi catchment area	Policy/Standards developed on agro-chemicals storage and usage.	Cabinet approval on standards/policy, progress report	Resources and capacity to develop practical cost-effective standards	Environment, DAFF (and NIOFA), NWSC
4.1.3	Develop relevant strategies to reduce threats of using agro-chemicals around the catchment area by local farmers	Reduce threats of pollution to the underlines groundwater lens within the catchment	Activity completion report, financial statement and progress report	Currently unfunded activity. Need to secure co-funding	DAFF, ENVIRONMENT, NWSC
4.1.4	Conduct public awareness programs targeting organic farming methods for reduced use of agro-chemicals, and standards for proper agro-chemical storage (refer component 6)	Increased awareness on organic farming and its principles;	Activity completion report, financial statement and progress report	Private sector and households participate and adopt principles of partnership for ongoing compliance	Communication and awareness grp, NWSC
4.2	Output 4.2: Improved Piggery Facilities including Effluent Waste Management Program (DAFF to Confirm)	Reduce threats pollution of groundwater and coastal water from piggeries waste	Demonstrate other benefit of collect and reuse Piggeries effluent	Awareness on other benefit of utilising piggeries effluent and its benefits	PMU- NWSC DAFF households
	Indicative Activities				
4.2.1	Conduct inventory of pig pens within the catchment area through GPS Mapping	Baseline data on No of pigs, sty's and location within the catchments area	Inventory report as a GIS Mapping, Report endorsed by NWSC	Households effectively participate in the activity	DAFF, NWSC
4.2.2	Develop standards and compliance requirements for pig pens and effluent disposal	Standards developed for pig pen and effluent disposal as per location	Cabinet Minute endorsing standards, progress report.	Households effectively participate in the activity; cabinet approve standards; policy and technical expertise available	DAFF, NWSC
4.2.3	Install tanks for piggery effluent collection tanks at piggery within the catchment area and undertake appropriate training on the usage of piggery waste collected	Piggery effluent tanks introduced and installed for piggeries located within catchment area	Activity completion report endorsed by NWSC	Sufficient resources available for tank installation; support from piggery operators	DAFF, NWSC, Water Supply
4.2.4	Develop piggery effluent management plan/program	Piggery effluent management plan/program introduced	Plan/program submits to NWSC for Cabinet endorsement.	It is possible to develop practical, affordable plan that adequately mitigate risks; resources and suitable personnel available	DAFF, NWSC, Water Supply



Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
4.2.5	Facilitating plan uptake through training and awareness raising	All collection piggery effluent operated in accordance with plan/program	Audit	Households adopt the management plan/program. Co-funded activity – dependent upon priorities of partner Agency	DAFF
4.3	Output 4.3: Improved storm water/off-road drainage to reduce risk of coastal pollution	Reduce effects on coastal waters marine life from direct flow discharge of sediments Volume of sediments collected	Appropriate sediments capture is constructed Annual report endorsed by NWSC	Level of direct discharge of sediments to coastal areas is reduced	PWD, Environment and PMU
	Indicative Activity				
4.3.1	Assess the current storm water drain system(s) and identify vulnerable and high build-up of sediment areas	Assessment (and required solution(s)) completed	Progress report	Local personnel can undertake necessary assessment. External funding on much of this component means that delivery is outside of the control of the PMU	PWD - Water Supply, NWSC
4.3.2	Identify and carry out solution to remove or reduce build up of sediments if road run-offs on the coastal road, and thus reduce runoffs seeping down to the reef	Reduced number /volume of sediment build-up areas; (Refer also to activities under 4.3)	Progress report, activity completion report	External funding on much of this component means that delivery is outside of the control of the PMU	PWD - Water Supply, NWSC
	COMPONENT 5: Improved water supply management to reduce peak demands and risk of saline up-coning				
5.1	Output 5.1: Reduced Peak Demand Abstraction Rate	Understand groundwater drawdown and water supply demand	Water Supply improvements reports in place	Water supply upgrades and improvements of equipments	Water Supply IWRM PMU
	Indicative Activities				
5.1.1	(Purchase and install water meters at each water bore and storage tank) Investigate implement full system water loss management SOPAC/PWD at Palliati/Tuila Area, through installation of households water meter-Replication from Fualahi Households metering under SOPAC/PWD	Data on volume of water loss	Water use Report endorsed by NWSC six monthly	Water meters are available; personnel availability	PWD - Water Supply, NWSC
5.1.2	Develop database in form of GIS on water abstraction for each bore, sustainable yield, pump efficiencies, pump logs to strengthen SOPAC&PWD System Loss Management Plan	Data on the volume of water abstracted from each water bore and storage tanks reflected in Project reports and Department's annual report.	Progress Report, Divisional/Department Annual Report.	External funding and operation of databases is maintained	PWD - Water Supply, NWSC

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
5.1.3	Develop database in a form of GIS on each storage tanks, effective storage, step test , area of coverage, demand and link with System Loss Management Plan and Niue Drinking Water Safety Plan (SOPAC/PWD).	Database developed	Progress Report.	Equipment and personnel availability	PWD - Water Supply, NWSC
5.1.4	Purchase materials for the construction of a new storage water tank.	New Storage Tank at Fou, Alofi North; new tank increase water supply volume to meet peak demand	Financial Statement and Progress Report.	Funds available and materials within budget	PWD - Water Supply, NWSC
5.1.5	Construct new storage water tank at Fou, Alofi North	Peak demand abstraction rate are reduced.	Progress Report, Divisional/Department Annual Report.	Landowner granted permission to construct new tank in the preferred location.	PWD - Water Supply, NWSC
5.1.6	Conduct public awareness on water usage and water wastage conservation measures (refer component 6)	Public awareness campaign	Progress Report	Baseline data on peak demand abstraction rate is available, and public will adopt water usage and wastage conservation methods.	Communication and Awareness Grp, NWSC
5.2	Output 5.2: Reduced volume of water leakage in the Water Supply System and Households level.	Maintain continued supply of safe drinking water at all time to all sectors of society Reduce time of water supply interruptions 40% reduction in leakage	Six-monthly progress report endorsed by NWSC and Communities Water Supply operates efficiently	Availability of human resources and appropriate tools and equipments	Water Supply IWRM PMU and NWSC
	Indicative Activities				
5.2.1	Strengthen and implement recommendation in SOPAC/PWD Water Demand-System Loss Management Plan for Tapeu-Alofi South and Pallati-Alofi North	Implementation of the Water Demand System Loss Management Plan	Progress Reports	Availability of equipment and personnel	PWD - Water Supply, NWSC
5.2.2	Conduct a survey to identify water leakages in the Alofi area (households, pipes and tank overflows)	Completion of the Water Leakage Report for Alofi area.	Progress report, Inventory Report; Divisional/Departmental Annual Report	Availability of equipment and personnel to undertake inventory.	PWD, GEF IWRM PMU NWSC
5.2.3	Develop a leak reduction program based on the survey findings.	Implementation of the Leak Reduction Programme	Leak Reduction Programme, Progress Report	Availability of equipment and personnel	PWD - Water Supply, NWSC
5.2.3	Undertake repairs on pipe leakages based on the leak reduction program	At least 75% of the identified Pipe Leakages repaired/replaced	Progress report; Divisional/Departmental Annual Report	Availability of equipment, machinery and personnel	PWD - Water Supply, NWSC
5.2.5	Investigate and implement best option to stop storage tanks overflows	Appropriate equipment install and operate	Progress report; Divisional/Departmental Annual Report, telemetry system and data	Availability of equipment, machinery and personnel	PWD - Water Supply, NWSC



Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
5.2.6	Procurement of underground pipe locator for GIS purpose of mapping Alofi water supply system for Village Water Plan	Procurement of underground pipe locator	Financial Statement, Progress Report	Cost of materials within budget	PWD - Water Supply, NWSC
5.2.7	Conduct public awareness and training on household water leakage and water conservation measures	Increased understanding on various measures of water conservations	Leaks reported in village inspection reports Survey report endorsed by NWSC	Public accept and practice water conservation measures	Communication and Awareness Gp, NWSC
	Component 6: Improved water resource management measures				
6.1	Output 6.1: Comprehensive Water Bore Analysis and Monitoring Program	Monitoring program established	NWSC endorsement of monitoring plan and monitoring reports	Resources available for monitoring	Water Supply and IWRM PMU
	Indicative Activities				
6.1.1	Install at least 6 multi-level piezometer nests for the monitoring of freshwater lens thickness, water level and salinity responses to recharge, abstraction, tidal and other influences	Procurement of multi-level piezometer nests	Financial Statement; Progress reports	Resources to procure and availability of driller	PWD - Water Supply, NWSC
6.1.2	Install multi-level piezometer nests	Multi-level piezometer nests installed	Progress reports	Installation is a straightforward process, and relevant machineries available and operational	PWD - Water Supply, NWSC
6.1.3	Procure and deploy groundwater monitoring probes for Alofi wellfield Piezometer nest	Groundwater monitoring probes deployed	Progress reports	deployment straightforward, equipment and personnel availability	
6.1.4	Develop a water bore analysis and monitoring program on Multi level piezometer nest	Water bore analysis and monitoring program established	Water bore analysis and monitoring reports, Progress reports	Piezometer nests are installed, vehicle, equipment and personnel availability	PWD - Water Supply, NWSC
6.1.5	Conduct periodic water bore analysis on the Multi level piezometer nest as required under the monitoring program and document results in report form	Water Bore Analysis Report; Improved stakeholder awareness and knowledge on status of water bore(s)	Water bore analysis and monitoring reports, Quarterly Progress reports endorsed by NWSC	Trained personnel collect data and analyse accordingly. <i>In-situ</i> probes continue to function	PWD - Water Supply, NWSC
6.1.6	Undertake groundwater assessment study on Alofi Well-field for Alofi Water Resource Management Plan	Completion of study and information incorporated in the Alofi Water Resource Management Plan	Alofi Water Resource Management Plan endorsed by NWSC, Progress Report	Personnel and/or expertise available and information collected is relevant for the Management Plan	PWD - Water Supply, NWSC

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
6.1.7	Assessment infrastructure requirements to strengthen institution capacity on rainfall data, drought analysis and interpretation , etc	Infrastructure/equipment procured; Data collected from equipment strengthen information base on characteristics of thickness of freshwater lens, level and salinity for recharge, abstract, tidal and other influence	Supporting data for the activity 4.1.1, progress report endorsed by NWSC, financial statement	Appropriate infrastructure/equipment available; personnel available to collect and analyse data from HYCOS Program	NWSC, Niue Met
6.1.8	Investigate closed hand-dug well locate in Alofi Well filed for monitoring purpose-	Groundwater monitoring point option for Alofi Catchment-National Hydrology and climate monitoring site	Data capture and progress report	Strengthen national capacity in hydrology information-groundwater assessment data	PMU Niue Met/Water Div
6.2	Output 6.2: Information on Production Bore Yield established.	Production bore yield established Monitoring program for pumping rates / pump efficiency & groundwater level drawdown	Monitoring program endorsed by NWSC Bore yield report endorsed by NWSC	Standardise pump types Limited draw down level appropriate pump maintenance programs in place	PWD –Water Supply and IWRM PMU
	Indicative Activities				
6.2.1	Develop a production bore yield test program on existing bore pumps for its efficiencies	Production bore yield program established	Progress report	Availability of equipment, machinery and personnel	PWD - Water Supply, NWSC
6.2.2	Determine and/or establish baseline data on production bore yield for the Alofi area and set up database on all pumps	Baseline data on production bore yield established	Progress report	Availability of equipment, machinery and personnel	PWD - Water Supply, NWSC
	Conduct six-monthly production bore yield tests as required by the program developed under 4.2.1.	Reports on production bore yield tests and bore pump performance	Reports on production bore yield tests endorsed by NWSC, Progress reports	Availability of equipment, machinery and personnel	PWD - Water Supply, NWSC
6.2.4	Document and disseminate results of the yield tests.	Reports on production bore yield tests	Reports on production bore yield tests posted on web and reports sent to all government agencies, Progress reports	Availability of equipment, machinery and personnel	PWD - Water Supply, NWSC
6.2.6	Develop Water Quality testing program for all bore pumps for any likely contaminants	Monitoring program established and adopted	Monitoring program reports endorsed by NWSC	Availability of equipment, machinery and personnel	PWD - Water Supply, NWSC
6.3	Output 6.3: Comprehensive Water Quality Monitoring System	Water Quality monitoring programs in place and follow WHO Standards and Guidelines	Dissemination of results to relevant sectors and the cabinet Ministers	Information on water quality narrative reports available	Health Water Supply-NWSC
	Indicative Activities				



Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
6.3.1	Undertake independent review Water Laboratory to verify accreditation and carryout recommended remedial actions	Water Laboratory meet minimum requirement of accreditation.	Independent consultant's report, Progress Report	Capacity, equipments and testing kits available for the water quality tests. Accreditation is largely externally funded, so beyond the control of the PMU	Health - Environment Division, NWSC
6.3.2	Investigate and establish relationship with international laboratory(s) in NZ for more comprehensive water quality testing and analysis	Established relationship with international laboratory	Agreement between Niue Health and international laboratory; progress report	Appropriate international laboratory will agree to provide assistance and relationship/agreement signed between two parties.	Health - Environment Division, NWSC
6.3.3	Determine baseline data of water quality of Alofi area water supply system	Water quality baseline data for each bore established.	Progress reports	Appropriate personnel, equipment and relevant testing kits available.	Health - Environment Division, NWSC
6.3.4	Develop water quality monitoring program for Alofi area (biological and chemical)	Program established.	Program established, progress report	Appropriate personnel, equipment and relevant testing kits available.	Health - Environment Division, NWSC
6.3.5	Explore and introduce of Patho Screen Field test Test Kit for Alofi community (100 test samples one per village)	Alofi Community confident with services provided by Government	Survey response endorsed by NWSC	Household understand and can carry out simple test. Community report any irregularities.	Health - Environment Division, NWSC
6.3.6	Conduct monthly water quality tests for Alofi Water supply system	Water quality test results	Water quality test results, progress reports	Personnel available to undertake tests	Health - Environment Division, NWSC
6.3.7	Develop appropriate parameters for coastal water quality monitoring	Parameters established and known	Database established on nutrient levels in Alofi Bay coastal area; progress report endorsed by NWSC	Baseline data available	Health - Environment Division, NWSC
6.3.8	Collect samples for external testing and analysis	Samples test and analysis reports	Progress reports endorsed by NWSC	Limited capacity to comprehensively test and analyse samples from coastal water areas.	Health - Environment Division, NWSC
6.3.9	Conduct public awareness (refer component 6)	Good understanding of Public on water quality and tests	Progress reports Survey (see later)	Information easy to understand and adopt	Communication and Awareness Group
6.3.10	Conduct assessment on coastal spring cave water, characteristics and linkages to water lens and coastal water	Information available on coastal spring cave water quality impact from household wastewater discharge, its characteristics and linkages to coastal water quality	Assessment report endorsed by NWSC, progress reports	Appropriate personnel, equipment and relevant testing kits available.	NWSC, Health, Environment and PWD-Water Supply
6.4	Output 6.4: Improved Protection for Boreholes	Bore Pumps headwork's secure and control entry to all sites Security fencing all bore sites perimeters	Completion report endorsed by NWSC	Equipments and drinking water quality protection in place	PWD –IWRM PMU
	<i>Indicative Activity</i>				

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
6.4.1	Assess the status of borehole headworks and identify appropriate remedial actions to improve protection of borehole from local pollution and contamination highlight in the Niue Drinking Water Safety Plan Improvements Schedule	Assessment report on status of borehole	Assessment report endorsed by NWSC, progress report	Personnel, transport and equipment available	PWD - Water Supply-IWRM PMU
6.4.2	Develop costing for recommended remedial action and procure materials as required.	Costing identified	Financial statement, progress report endorsed by NWSC	Personnel available; materials available locally; budget able to cover costs of remedial works	PWD - Water Supply IWRM PMU
6.4.3	Carry out improvements for/on all boreholes headworks	Boreholes improvement work completed	Financial Statement, progress report endorsed by NWSC	Personnel, transport and equipment available	PWD - Water Supply-IWRM PMU
6.4.4	Assess the status of All Tanks sites headworks and identify appropriate intervention/actions to improve protection on Drinking water storage in all Public Water Tanks in Alofi- highlight in the Niue Drinking Water Safety Plan Improvements Schedule	Assessment report on status of all demo tank sites headwork's	Assessment report endorsed by NWSC, progress report	Personnel, transport and equipment available	PWD - Water Supply-IWRM PMU
6.4.5	Develop costing for recommended remedial action and procure materials as required.	Costing identified	Financial statement, progress report endorsed by NWSC	Personnel available; materials available locally	PWD - Water Supply-IWRM PMU
6.4.6	Carry out improvements for/on all Water Tanks headwork's	Improvement work completed	Financial Statement, progress report endorsed by NWSC	Personnel, transport and equipment available	PWD - Water Supply-IWRM PMU
	Component 7: Education and Awareness Program				
7.1	Output 7.1: Improved understanding and awareness on water, the threats and the policy environment.	Development of the National IWRM Communication Strategy	Public awareness campaign utilising communication strategies	Increase awareness and education on Water Resource Management in all level of society	NWSC Awareness and
	Indicative Activities				
7.1.1	Establish a Communication and Awareness Group	Communication and Awareness Group established and endorsed by NWSC	Membership confirmed by NWSC, progress report	Members are representative of sectoral and government, private sector and community stakeholders	Communication and awareness grp. NWSC
7.1.2	Develop a Communication and Awareness Strategy for NWC	Improved understanding and awareness on water, threats and policy framework.	Communication Strategy endorsed by NWSC, Workshop reports, financial statements, surveys/questionnaire	Strategy is easy to understand and implement.	Communication and awareness grp. NWSC



Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
7.1.3	Implement Communication and Awareness Strategy, incorporating activities highlighted in components 1 - 5 above	Improved understanding and awareness on water, threats and policy framework.	Workshop reports, financial statements, surveys/questionnaire, progress report	Strategy complements the activities highlighted in components 1 - 5.	Communication and awareness grp, NWSWC
7.1.4	Demonstrate improved community capacity and awareness in water use efficiency and water management	Household survey to establish baseline Survey to identify changes	Survey reports endorsed by NWSWC	Community participation in surveys	PMU
8	COMPONENT 8: Delivery of the Niue GEF IWRM Demonstration Project	Delivery of project activities on time and on budget	Quarterly, annual and end of project reports Audits	Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters	
8.1	Output 8.1 Successfully managed project	Delivery of project activities on time and on budget	Quarterly, annual and end of project reports Audits	Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and natural disasters	
	Indicative Activities				
8.1.1	Establish Project Management Unit	Recruitment of Project Manager and Project Assistant Establishment of a Project Management Unit Office	Signing of contracts	Capacity to attract/retain appropriate candidates	IWRM PMU- IWRM RPCU
8.1.2	Establish and support the National Water Steering Committee (NWSWC), incorporating cross-sector, government, civil organisational, private sector and community representatives responsible for delivering the project, with public accountability	Establishment of the NWSWC	Cabinet endorsement of NWSWC and membership	Political resistance to proposed governance structures; Significant changes in enabling environment, including but not limited to political and financial stability, political commitment and changes in legislation and policy	Health – Environment-PWD and PMU
8.1.3	Attend regional meetings and workshops/training on IWRM matters	Niue comply with Regional IWRM project requirements; improved knowledge and understanding on threats and ways to control these.	Financial Statements, Progress reports	Niue will attend relevant regional meetings and/or training as invited.	PWD, NWSWC
8.1.4	Develop and implement Replication Strategy	Replication Strategy	Endorsed by PSC	Capacity to identify lessons and appropriate replication mechanisms and tools	
8.1.5	Develop and implement Communication Strategy	Communication Strategy Annual Reviews Annual events work plan Capacity Building Strategy	Strategy endorsed by NWSWC Annual events workplan endorsed by NWSWC Strategy endorsed by NWSWC Increased capacity?	Capacity to identify all relevant stakeholders and most appropriate communication mechanisms	
8.1.6	Develop and implement Capacity Building Strategy	Increased capacity across		Willingness of stakeholders to engage Good communication with stakeholders on expectations and roles	

Output No.	Activity	Key Indicators	Means of Verification	Assumptions/Risks	Responsible Agency
		government agencies Increased capacity across stakeholders identified through workshop attendance and survey	Workshop reports Survey results		
8.1.7	Develop and implement Engagement Strategy	Engagement Strategy Outcome?	Strategy endorsed by NWSC	Good communication with stakeholders Willingness of community to engage	
8.1.8	Manage budgets, deliverables and timelines	Project delivered on time and on budget	Project quarterly and annual reports Audits	Further changes to GEF budgets or co-funding may compromise all three components. Risks identified above also likely to impact on budgets, deliverables or timelines	
8.1.9	Source additional funding to add value to project outcomes	Co-funding obtained to delivered unfunded project components	Project quarterly and annual reports Audits	Assumption that funding is secured prior to project inception. Inability to source additional funding will limit value-added project components	
8.1.10	Complete reporting commitments	Reporting commitments completed on time	Project quarterly and annual reports Audits		



Annex 5: Results Notes

Implementing Sustainable Water Resource and Wastewater Management in Pacific Island Countries



GEF PACIFIC IWRM PROJECT RESULTS NOTE

<http://www.pacific-iwrn.org/results>

RSC 5, 2013

Using Integrated Land Use, Water Supply and Wastewater Management as a Protection Model for the Alofi Town Groundwater Supply and Nearshore Reef Fishery



World Water Day 2012 Celebrations

Top 3 Project Results

1. Enactment of the Niue Water Act, providing a framework for water allocation and water resource protection management
2. Establishment and implementation of National and Village Drinking Water Safety Plans to provide safe drinking water to all central areas in Niue.
3. On the ground works to improve Niue's water security, by reducing water loss through leakage and increasing water storage.

Andre Siohane
Andre.Siohane@mail.gov.nu
Department of Public Works

1. PROJECT OBJECTIVE

To demonstrate integrated water and wastewater resource management through stakeholder engagement to protection of this critical aquifer and well-field through a parallel process of:

- A. Mitigation of existing threats from contaminants,*
- B. On-the-ground protection, and*
- C. Improved user-resource management.*

The demonstration project is designed to utilise specific and tangible Stress Reduction measures to improve water resources management and protection, and link these to water quality outcomes and support improvements in integrated governance arrangements of policy and planning.

2. RESULTS: PROCESS

Despite significant groundwater resources, Niue's governance framework for water management prior to the project needed updating as water resource and sanitation management was not coordinated, had minimal engagement across sectors and key stakeholders and the groundwater resource was not adequately protected.

Through the project and with support of the EU IWRM partner project, legislation has been updated to provide the governance framework; national and district coordination bodies have been developed to provide direction and direct engagement for the community, government sectors and other stakeholders in water management decisions and national and village water safety plans have been endorsed and are currently being implemented.

As the project has progressed, the level of coordination and collaboration at the national level has increased and continues to strengthen.

The community has participated with water activities from maintenance, implementation and also negotiation of community activities at both the local and national level. Community support is important for building awareness and ownership at the local level. It is also important as activities conducted at the community level are either directly experienced, or will be discussed in the political arena, due to the close link of politicians to their communities. This has been achieved through the village water safety management planning process as well as Plan implementation. It has resulted in a significant increase of the national budget allocation towards water programmes over the last year.

Relevant government sectors are engaged and providing information as well as implementing some of the activities arising from the project. This increased level of support has resulted in better management of the island water resource. Niue has a small population and limited human resources. Working together has helped achieve the project's target and goals.

Decision makers want positive things happening on the ground that reflect or benefit the entire community, that will also help support their discussions and dialogue with other partners.

The IWRM project has helped in lead Niue towards reform in the water and waste management sector that has provided additional opportunities to deliver safe drinking water to the communities while improving groundwater protection.



Figure 1: World Water Day 2012 celebration and the launching of Pacific Blue Ribbon, an awareness-raising programme on water management issues.

2(a) INDICATOR#1: REVISED LEGISLATION PROTECTING WATER

Before the project, there was a lack of regulations supporting water protection and water use efficiency. This meant that there were very limited options for managing the potential impacts on the main drinking water resource in Niue, the groundwater lens. Additionally, the existing legislative framework did not support integration of water resources management in Niue, with individual Ministry responsibilities linked to specific legislation. The project aimed to revise the Niue Water Bill.

The enactment of the Niue Water Act was achieved in 2012 and has provided the framework for regulations to address concerns relating to water use efficiency, allocation and protection of drinking water resources. Additionally, it provides for the development of a national Water Resource Management Plan and integration of water and sanitation management across government and other stakeholders who now administer the Act in an integrated approach across three separate agencies.

The Water Act 2012 has provided the opportunity for further identification of other tools and activities that are important for national water and sanitation in Niue. This includes helping the implementing agency become a member to the New Zealand Standard in preparation for reviewing the National Building Code. This is particularly important for regulating septic design and determining national environmental standards for effluent control to mitigate groundwater pollution.

2(b) INDICATOR#2: VILLAGE WATER MANAGEMENT PLANS FOR ALOFI NORTH AND ALOFI SOUTH VILLAGE COMMUNITIES IMPLEMENTED

Prior to the GEF IWRM project, water management in Niue was broadly considered the responsibility of government, with very little community engagement. Household water use rates were amongst the highest in the world, reflecting a lack of understanding and ownership of water resource management. The project aimed to develop “Community to Cabinet” Village Water Management Plans which be endorsed by Cabinet and audited. Two Village Water Management Plans were developed in the demonstration villages during the second year of the project (2010). The Plans have been approved by the Village Councils, endorsed by the NWSC and formally launched at the village level. The Plans assisted with engaging communities in water management, identifying key actions to be taken, strengthened communications on key water issues and helped foster a sense of ownership.

The development of Village Water Management Plans in both Alofi South and Alofi North has also provided a mechanism for the community to communicate with its national partners including the Cabinet Ministers, as well as different groups within village communities. Important processes have been gender mainstreaming and the increased capacity of communities to support the implementation

of drinking water safety plans. This in turn has contributed to a measured reduction in household water use.

The Village Water Management Plans have been well used by the two pilot communities. The villages have used the plan to secure extra financial support for implementation. For example, Alofi North secured funding from the Government of Niue (GoN) to complete their new water supply system at Fou relocation village. The Plans have been used by the Implementing agency to engage the communities in maintenance of village bore and tank sites. This provided additional opportunities for financial support to communities activities.

In 2013, the Village Water Management planning process was replicated in the three pilot communities of EU USP-GCCA Programme (building resilience to climate change).



Figures 2 & 3: Gender Mainstreaming in developing Village Waters Management Plan



Figures 4 & 5: Launching of the Alofi South Village Water Management Plan

2(c) INDICATOR#3: NATIONAL COMMUNICATION STRATEGY IMPLEMENTED

Prior to the project, the majority of people in Niue had limited understanding of our national water resource status, how water is managed for their communities and the threats to long-term sustainability. This was reflected in extremely high household water use and new developments siting septic tanks directly over critical drinking water resources. The aim of the project was to develop a national communication strategy which would be endorsed by the national APEX body, the Niue Water Steering Committee (NWSC). The Communication Strategy is in a final draft and is still to be submitted to the NWSC.



Developing and implementing a National Communication Strategy has started to increase the awareness of the people of Niue on the importance of water resource management and in particular, conservation measures that are vital for ensuring that water is safe for consumption and use. The importance of safeguarding natural supplies for future generations and the increasing risks posed by climate change are starting to be recognised. Annual World Water Day events have become important at a national level as a mechanism for bringing people's attention to water resource management issues. Participation rates at these events reached up to 50% of the national population. National Project Coordinators from a range of initiatives coordinate on planning and how to ensure successful awareness campaigns.



Figures 6 & 7: World Water Day 2012 celebration and the launching of Pacific Blue Ribbon

Schools continue to be involved and learn from experiences with the IWRM project. For example, national water and sanitation issues are being selected as topics at the Annual Speech competition. Teachers proactively approach the for study tours, visiting the PWD department and project sites.

The IWRM Super Rugby Tipping competition initiative from the region is one of the greatest tools for information reaching out to local people. This arrangement sees other stakeholders becoming part of the competition – and IWRM becoming a regular part of their week. The IWRM and PACC project also sponsor the national broadcasting body to view some of the games on TV and showcase water conservation videos during commercials. The Niue Team has won this competition twice now.

2(d) INDICATOR#4: IWRM NATIONAL STRATEGY IN PLACE

Before the IWRM project, the Niue National Strategic Plan 2008 - 2013 provided overall guidance for the sector. Previously, there were many reports guiding the management of the water sector, however, they lacked financing and implementation mechanisms. The project aimed to develop a IWRM Strategic Plan to guide investment in the sector. The project developed the IWRM Strategy Plan 2012 – 2014 which aims to: *“Maintain.... our community's access to water of clean quality and appropriate quantities to meet all reasonable health, environmental and economic development needs”*. It provided a foundation to build a sustainable water future that meets the economic and social needs while preserving the environment integrity, social stability, and the Niue water culture. The Strategic Plan identified 7 key thematic areas with specific goals. Each goal has a set of activities and actions required, notes the agency responsible for coordination and implementation as well as a overall monitoring template.

The Strategic Plan is in draft and being revised in late 2013 to include costing and action plan. Once these are finalised it will be submitted for endorsement at the National Water Steering Committee and subsequently can be submitted to Cabinet.

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3. RESULTS: STRESS REDUCTION

Niue relies heavily on groundwater for water supply. The national groundwater reserves are significant; however poor water use efficiency (WUE), in particular system losses and inadequate balancing storages threaten national supplies. In the longer-term, maintaining groundwater quality is the key challenge for sustainable water resource management. The key threats to groundwater quality include pollution from agriculture (including piggeries and chemical use), disposal of medical wastes, septic tanks and waste oils.

The GEF IWRM project has reduced water resource stresses by reducing system losses and increasing storage to provide greater supply reliability. This has been combined with a program of household leak reductions to increase national WUE. The pollution stresses on the groundwater resource have been addresses through a combination of working with the agriculture sector on piggery management, working with the hospital on managing hazardous medical wastes and providing a mechanism for the safe disposal of 14 kL of waste oils.

The project continues to support national stress reduction activities to ensure that water quality is protected. This has been achieved through development of national water, sanitation and waste strategies that link to national development priorities. The development of the National IWRM Plan and costed Action Plan as an outcome of demonstrating activities and the development issues identify under the National Water, Sanitation and Climate Outlook including the National Water, Sanitation and Waste Indicator Framework. The intention of the National IWRM Plan facilitated identification of the issues and can be used as a roadmap for implementation.

The roadmap will be an opportunity for Niue to introduce WUE incentives such as cost recovery for sustainable uses of the water resource in communities and also in private business. This will be a challenging task for the project and engaged in 2014.

The project has also helped provide technical support to the PACC project in Niue which is building household rainwater tanks as adaptation activity. This project will also help reduce groundwater stress by providing alternative fresh water during droughts and extreme weather events

3(a) INDICATOR#1: REDUCTION IN DRINKING WATER RESOURCES POLLUTION

Waste oil storage has been poorly managed in Niue, with a lack of coordination and budget allocations from national government and private sector in addressing safe handling and disposal of waste oil. An inventory at the start of the GEF Pacific IWRM Project identified approximately 25 kL of waste oil stored in leaking drums and seeping into the ground and ultimately potentially into the groundwater. The project aimed to establish guideline/standards on fuel and oil storage and disposal including waste oil.

The project has established a national collection and disposal mechanism, and 56% of national waste oil has been collected and stored in safe containers and shipped to New Zealand for recycling and/or safe disposal. The empty containers used to ship fuel to Niue are used to transport the waste oil minimizing transport costs. The project has established effective waste oil storage and management around Alofi. Disposal options are still being explored.



Figure 8: Waste Oil transfer for transport

The guideline is yet to be drafted and tabled with the NWSC for endorsement before submission to Cabinet.

Recommendations will be made within the draft to identify a regular funding mechanism for future management and disposal of waste oil. The IWRM project is working with the GEF PAS project on options and will continue to take the lead.



3(b) INDICATOR#2 REDUCTION IN DRINKING WATER SOURCE POLLUTION DISCHARGE TO DRINKING WATER SOURCE AT THE NATIONAL SCALE

Before the IWRM project, the Niue Hospital, which was constructed in 2006 after Cyclone Heta, had no strategy for the safe disposal of medical waste. The IWRM project aimed to reduce pollution by 30% from waste oil, piggeries, agricultural chemicals and hazardous hospital waste. The IWRM project included the hospital as an NWSC member and supported the Public Health Officer to develop a Hospital Hazardous Waste Management Plan. The Plan identified reduction in toxic cleaning products, reduction in water use, upgrading the incinerator and safe removal of infectious materials.

The IWRM project supported monitoring of water quality at the demonstration project and other national sites, such as the hospital, through procurement of the materials for testing, training of staff and upgrade of the water laboratory sited at the hospital.

Further, the IWRM project initiated review of aviation fuel storage sites at the international airport. This review revealed that current infrastructure does not meet safety pollution control standards and 'bundling' was required. IWRM facilitated the design for building bunding and sourced co-financing of NZ\$100,000 from NZAID to cover the costs of construction.

The communities' water availability has significantly increased, as has their confidence in national water supply authorities. The communities are happy with the outcome of the project which provides them with additional opportunities for development now they have regular water supply. Water wastage has also been reduced which reduces the cost of water supply through purchasing fuel for pumping water into the storage facilities.

A new 90m³ water tank has also been installed for the Fou community of Alofi North. Increased storage contributes to water availability during times of natural disaster. The project also helped them secure further co-financing to cover the costs of installing new pumps and a pipeline.

Further, additional funding was secured under the EU Energy Efficiency program to procure Variable Speed Drive Pumps that will again contribute to more efficient water supply system water loss reduction.

3(c) INDICATOR#3 NATIONAL INDICATOR FRAMEWORK IMPLEMENTED

Before the IWRM project the health department had a water quality management plan, however, there was no comprehensive national plan to ensure the range of country-specific water management issues were being comprehensively addressed. The WHO guidelines were used for drinking water standards. The IWRM project facilitated the development of the IWRM National Water, Waste and Sanitation Indicator Framework. This framework has been integrated into the IWRM Strategic Plan and will be included into the Niue National Waste Strategy and Niue National Strategic Plan which are currently being reviewed. The Framework focus' on: Sanitation and Waste, and Water Quality. It outlines recommendations ranging from water governance to pollution control, ecosystem impacts and community engagement.

3(d) INDICATOR#4: WASTE WATER DISCHARGE FROM DEMONSTRATION SITES MEET NATIONAL STANDARDS

Before the IWRM project there no national wastewater effluent standards. The National Building Code provided guidelines for septic design and construction, however, it was not being followed and there was no inspection of systems during or after construction. The IWRM project aimed to ensure regulations were being met. As there are no wastewater effluent regulations in Niue, the IWRM project has been supporting the review of the Building Code to ensure septic tanks are permitted and monitored. The IWRM project also supported the implementing agency, Public Works, to become members of New Zealand Standards. This activity is on-going as the Building Code is still under review.

3(e) INDICATOR#5: LAND USE MAPPING AT THE CATCHMENT AREA

Before the IWRM project there was no GIS mapping of community water and waste management infrastructure for developing protective measures around Well Heads. The project aimed to map activities and infrastructure in order to develop Well Head Protection Plans. At this stage, much of the information has been gathered and stored at the National GIS database. This is a sensitive matter due to the nature of land ownership in Niue. A national stakeholder consultation for developing Well Head Protection zones in village catchment areas will be conducted in the last quarter of 2013. This process will help national government to reach management agreements with landowners.

Mapping has helped the community to manage their catchment areas and consider protection measures as well as land use and planning.

3(f) INDICATOR#6: NATIONAL STAFF ACROSS INSTITUTIONS WITH IWRM KNOWLEDGE AND EXPERIENCE

Before the IWRM project, there was limited opportunity for government staff to upskill in IWRM. The project aimed to increase national knowledge in IWRM. In the second year of the project two of the implementing agency staff attended 4 weeks IWRM training in Japan under the JICA Bilateral support project. After their training they became more effective in their work and also more involved in implementing IWRM and other project activities.

Over the duration of the project the implementing agency has had 3 new trainees and 2 staff gain qualifications under the APTC regional programme. Two staff have also attended IWRM capacity building training overseas. There have been many community-based awareness and training workshops conducted based on the skills gained from staff training.

Furthermore, the IWRM National Focal Point successfully completed his Post Graduate Diploma in IWRM under the IWRM regional training partnership with the Australian University. This was recognized and acknowledged by Niue Government at the Annual Award Night held in Oct 2013.

4. RESULTS: WATER RESOURCE AND ENVIRONMENTAL STATUS

The water supply in Niue is groundwater-based and un-chlorinated. The lack of a water safety plan to provide confidence in groundwater and the presence of unprotected well heads were highlighted as risks to maintaining safe water supplies.

The establishment of the National Drinking Water Safety Plan and implementation under the Niue GEF Pacific IWRM Project, together with the development and implementation of village water management plans and ground works to protect well heads provides confidence that safe drinking water is now being provided to Alofi North and South, where 45 % of the population of Niue lives.

Niue understands the importance of clean water and wants to protect ground water quality. The Hon Premier made this commitment on Niue's behalf at the 2nd Asia Pacific Water Summit which focused on supporting pacific leaders to consider the impact climate change will have on the future of the region. The Pacific Statement was also endorsed by Niue at the Summit.

4(a) INDICATOR#1: POPULATION WITH ACCESS TO SAFE DRINKING WATER SUPPLY

Before the IWRM project, Alofi town water supply was at risk due to seepage of residential sewage from septic tanks; seepage of waste from piggeries, agricultural chemicals, industrial wastes, and seepage from rubbish dumpsites as well as contamination of the storage and distribution systems. The project aimed to implement the activities within the Niue Drinking Water Safety Plan 2010 and increase the percentage of Alofi residents with access to safe drinking water by 90%.

The project implemented parts of the Niue Drinking Water Safety Plan. The components included: two new water reservoirs at Alofi, water quality monitoring kits and training to Alofi residents, and training on water infrastructure maintenance. With these components of the Water Safety Plan implemented, the 450 people living in Alofi now have access to reliable and clean drinking water. Further, the development of Village Water Safety Plans strengthened the communities' knowledge about managing the water resources and managing water efficiently.

The auditing of the National Drinking water safety plan has brought opportunities for the project to provide further support to its implementation. Secure safe drinking water for communities is a priority. A peer review is required in order to finalise the document for submission to Cabinet.



Figure 11: Demonstrating fixing household water leaks with Village Communities



Figure 12: Implementation of Village Water Management Plans

4(b) INDICATOR#2: WATER CONSERVATION AND DEMAND MANAGEMENT MEASURES

Prior to the GEF Pacific IWRM Project, Alofi Town’s water was supplied by a heavily leaking 325m³ (456kL) tank. It provided ~ two days water supply storage for the Alofi community, meaning that the community was particularly vulnerable to groundwater pollution or pump failure. The project aimed to increase Alofi Town water storage by 20% and ensure regular supply to residents and businesses.

The project has seen the replacement of the existing tank with two new 240 m³ storages, increasing storage by over 45% and significantly increasing supply security by eliminating storage leakage losses.



Figure 9: The two new 240 kL storage facilities at Alofi South



Figure 10: The new storage tanks (left) are located next to the old leaking storage (right) which had 456 kL capacity.

4(c) INDICATOR#3: LESSONS LEARNT INCORPORATED INTO OTHER PROJECTS AND/OR OTHER REGULATIONS

Before the IWRM project, no Village Water Management Plans had been developed. Water was considered the responsibility of the government and local communities did not engage with the issue other than to call the relevant government department when there was a problem. The IWRM project aimed to replicate and demonstrate the benefits of Village Water Management Plans by the end of the project implementation phase. In 2013, The UE-funded Global Climate Change Adaptation (GCCA) project, implemented by the University of the South Pacific (Niue branch), embraced the IWRM village management plan model and will replicate it in their three pilot villages of: Makefu, Tamakautonga, and Avatele. At this time, Makefu has initiated the process, completed the community consultation phase and are drafting the initial Plan. The other two villages are following a similar process.

The IWRM team provided technical guidance on the process to the community and attended the initial Makefu consultation.

The USP GCCA project is looking at building climate resilient communities and water is a critical for all three communities.

There are other opportunities for replicating the IWRM community planning approach which are being explored by the Department of Environment and Global Environment Facility Small Grants programme.

4(d) INDICATOR#4: BEST APPROACHES TO IWRM AND WUE MAINSTREAMED INTO NATIONAL AND REGIONAL PLANNING FRAMEWORKS

Before the IWRM project, IWRM concepts and information management was not digitized. The IWRM project aimed to ensure that national strategies incorporated the best IWRM approach. The IWRM project identified that information management would be strengthened if water/land data was managed with GIS mapping. This would enable information to be visually represented, available to a range of stakeholders, and would improve monitoring and trend analyses. The IWRM project also developed a water database at the Justice, Lands and Survey Department. The support included: hand-held GPS devices, software and on-going coordination support. This database has a broader application and is also used by the Land Court, conservation, fisheries and Utilities. It established the foundation for national coordination of information management in Niue. In the demonstration sites, the IWRM project has mapped piggeries, septic tanks and water assets.



Annex 6: Awareness Materials Developed and Media Coverage

Annex 7: Participatory Monitoring and Evaluation Plan



Annex 8: Replication and Scaling-up Plan

NIUE NATIONAL REPLICATION GUIDE FOR IWRM

Summary of Recommendations for the Replication of Village Water Management Plans

IWRM – NIUE TECHNICAL DOCUMENT

INTERGRATED WATER RESOURCE MANAGEMENT (IWRM) of Niue 2011



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ABBREVIATION AND ACRONYMS

BAS	Business Advisory Service
DAFF	Director of Agriculture Forestry and Fisheries
DCA	Director of Community Affairs
DoE	Department of Education
DoE	Department of Environment
DoH	Director of Health
EIA	Environment Impact Assessment
EU	European Union
GEF	Global Environment Facility
IWRM	Integrated Water Resource management
NGO	Non Government Organisations
NIUANGO	Niue Island United Association of Non Government Organisations
NWSC	Niue Water Steering Committee
SOPAC	South Pacific Applied Geosciences Commission
SWOT	Strength Weaknesses Opportunities Threats
PACC	Pacific Adaptation to Climate Change
PMU	Project Management Unit
PWD	Public Works Department

NIUE WATER CHARACTERISTICS	
Population served	2006 census; 1,625 people; 802 males, 823 females.
Land Area	259 square kilometres (100 square miles).
Exclusive Economic Zone (EEZ)	390,000sq. km.
Climate	Wet season (summer): October – February. Dry season (winter): May – August.
Average Temperature	Average temperature 27° C.
Average Rainfall	Annual mean rainfall 2066mm
Niue Groundwater	Approx 132 million cubic meters of recharge. Lens can store 3 months recharge.



	34 -55m below ground level.
Water Treatment	None.
Quantity	Ground water supplies approximately 350 litres of water per person per day.
Domestic Water Use	Supplies 80%.
Agricultural Water	Supplies 15%.
Commercial and Industrial Water Use	Supplies 5%.
Quality	Testing reveals no evidence of Microbiological contamination. Testing reveals no evidence of Chemical contamination.
Annual Cost of Water Pumping and Reticulation	\$85,000.00 cost of electricity pumping \$246,000.00 cost including reticulation
Water Supply Systems	Pump systems. Gravity systems.
Surface Water	None. Surface water can be found in caves.
Water bores	9
Reservoirs	7

Executive Summary

It can be challenging for Governments to thoroughly manage the groundwater resources without contribution from communities. Involving village communities in co-managing water resources would be a significant goal, particularly to address water demands, loss and water use efficiencies.

In Niue the first two village water management plans done for Alofi South and Alofi North villages were developed throughout consultations held in February 2010 between Niue Government in conjunction with GEF IWRM, EU IWRM, SOPAC, Alofi South village, Alofi North village and stakeholders.

Both the IWRM demonstration host villages of Alofi South and Alofi North formed village water working groups combining women and men to coordinate the implementation of the two village water plans. Village water working group members were selected from the groups that led the groups during the village consultations.

Village water working groups through the Village Councils decided to prepare resource schedules to describe budget estimates required for each target in the village water plans. Chairperson of the village water working group reports to the Village Council and can attend the Niue Water Steering Committee meetings on behalf of the Village Council. It is noted that budget estimates on target outputs can range from high cost and low to no cost when prioritising the activities. Developing Village Water Management Plans in villages can be a high to low cost activity depending on the size of the village.

Interests to formulate similar village water plans in other villages were expressed by Village Council's representatives that attended the community training held 2rd – 3rd June 2011 (Technical Report titled Community Leaks and Repairs Training Community Water Quality Testing Training). This Village Water Management Plan replication guide is prepared in respond to the expression of interests from other Village Councils.

This replication guide also ranked villages in the remaining twelve villages on Niue based on village situations outlined in the SWOT analysis. Working with water plans

on a village by village basis is seen the best approach due to many reasons including the powers of each Village Council executive.

NWSC will consider the recommendations made in this guide and determine next steps. The water use efficiency ultimate goal is for all villages on Niue to have village water management plans.

Introduction

Groundwater lens has always been vested in the Crown where the water resource legislation states the right to use, flow, piping, storage, sale and control to all groundwater is vested in the Crown. The Crown's water rights prevail over any authority conferred by or under any other Act or law, except to the extent to which this or any other written law expressly provides.

IWRM have two programs funded by the Global Environment Facility (GEF) and European Union (EU) (Memorandum of Agreement between SOPAC and PWD of Niue Government signed July-August 2009). The main objective is to integrate water resources management and water use efficiency. To ensure there is balance of overuse and conflicting uses of freshwater resources through policy and legislative reforms. To ensure also about the implementation of applicable and effective Integrated Water Resources Management (IWRM) and Water Use Efficiency (WUE) plans.

EU IWRM is a 2 years program designated to deal with freshwater policy matters and support the functions of the Niue Water Steering Committee (NWSC Terms of Reference). GEF IWRM is a 5 year program (2010 – 2014) which Niue selected groundwater, wastewater and coastal and marine waters as the focal areas for the demonstration project Integrated Water Resource Management Demonstration Project (Project Inception Report August 2009). GEF also funds the Niue Pacific Adaptation to Climate Change (PACC) program that envisages supplying homes with water tanks for rainwater catchments.

Several policy frameworks are readily in place in Niue that caters protection including management of the groundwater (Drinking Water Safety Plan, June 2009 Improvement Schedule Technical Assistance), (Niue Groundwater Analysis, August 2010), (An economic assessment of water safety planning, June 2010).

Scope of the Niue Island National Integrated Waste Management Strategy and Action Plan 2010- 2015 covers the management of solid, liquid, chemicals and hazardous waste, including special wastes such as medical and quarantine wastes. Health Department also has a Waste Management Plan June 2010 with a mission statement; To ensure that waste produced at the hospital is managed through a system that is safe, efficient, and cost effective and considers environmentally safe.

The Niue sustainable coastal development policy was established in April 2008 that has 6 specific goals addressing coastal and marine waters.

Membership of the NWSC comprises of the Director of Public Works Department (PWD) current Chairperson, Director of Environment (DoE) current Vice Chairperson, Director of Health (DoH), Director of Education (DoE), Director of Community Affairs (DCA) Director of Met Office, Director of Agriculture, Forestry and Fisheries (DAFF), Treasury Donor Officer, Business Advisory Service (BAS), Niue Island United Association of Non Government Organisations (NIUANGO), GEF Coordinator, PACC Coordinator. NWSC has been reviewed once and can review if when necessary to ensure the functions are effectively committed. The Niue Water Steering Committee will have to change to a Council once the Water Resource Bill is passed.



Purpose of this Replication Guideline

1. To guide the NWSC in making decisions for possible steps to pursue the IWRM concepts such as village water management plans to other villages.
2. Provide awareness for stakeholders with water management issues relating to village water management plans.
3. Provide an analysis on village water situations.
4. Strengthening community ownership and participation in water resource management.

Opportunities to develop Village Water Management Plans in villages

Annual Grants (\$5,000.00) allocated from Government budget to Village Council is one funding alternative better committed to developing village water management plans (Low Cost).

EU IWRM is a two year European Union funded project (2009 – 2011). GEF IWRM is a five year Global Environment Facility funded project (2009 – 2013). A project Logframe has been developed by the GEF IWRM that describes the activities to be implemented under the Demonstration project and national programs.

It is desirable that funds be identified and made available to convene similar processes that done with developing the two Alofi village water management plan.

Opportunities to implement targets identified in the Village Water Management Plans

The GEF 5 cycle is a key opportunity. Other opportunities to fund the activities in the Village Water Management Plans can be direct to the donor/s from the Village Councils or through with Government.

Village Community Settings and Stakeholders

Villages carry out elections for the Village Councils every 3 years to comply with the Village Council legislation. Number of Village Council members in the executive range from 3-5 members depending on the size of the village.

Most villages have a community hall to convene village events as well as village meetings. All villages have an Ekalesia Niue Church that has the highest number of spiritual members. Deacon forums in Churches are convened in some village which covers not only Church issues but village projects as well.

The 14 villages in Niue have a member of parliament elected every 3 years. There are also 6 Common Roll members that are elected every 3 years with the 24 village member of parliaments.

There are village based organisations for youth, women and men that work under the umbrella of national Non Government Organisation (NGO) bodies with Constitutions.

Village Councils are community based but its role is administered by legislation.

Water Resource Legislation Objective

The objective of the legislation is to provide an administrative and regulatory instrument for the sustainable, efficient and coordinated development, extraction, protection, management and use of the water resources of Niue for the benefit of both current and future generations.

IWRM has made an effort to link Government with the two villages of Alofi during the establishments of the village water management plans. Integrating national and local partnership arrangements in the beginning brings about early ownership of the initiatives including wider interests to the water issues and the required actions to respond to the threats.

It is expected that local villages will remain reliant on Government or external assistances for financial support. It is also advised that village water plans must have the resource schedules so to determine the budget estimates on each target and partners. The resource schedule should rank the priorities on each target and implementation schedules. Some activities are no cost and some low cost.

The responsibility of the NWSC will not only make decisions on the replication process but also to manage the deliverance of replication and monitoring.

Swot Analysis

The SWOT analysis provides explanatory guide on village situation such as population status, existing programs, water concerns and or other existing village projects. Government is included as part of the SWOT analysis because of the engagement factors and partnership alternatives such as Government to assist strengthen the village capacity needs where necessary. Government will support with the development of the Village Water Management Plans.

Recommendation

1. The Niue Water Council is invited to consider dialoguing with Village Councils to explore the interested to develop Village Water Management Plans based on the SWOT analysis and in order of village ranking.

Village ranking:

- | | | |
|-----------------|---------------|-------------|
| 1. Vaiea | 5. Namukulu | 9. Makefu |
| 2. Tamakautonga | 6. Hikutavake | 10. Liku |
| 3. Hakupu | 7. Lakepa | 11. Toi |
| 4. Tuapa | 8. Mutalau | 12. Avatele |



Annex 9: IW Pilot Project Logframe

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
1. Building ecosystem and climate change resilience via national actions to strengthen the enabling environment and monitoring capacity for water systems in Niue	1.1 Nationally endorsed planning and policy framework for water use efficiency including a cost recovery and system installations strategy	Status of endorsement of National Water Use Efficiency Policy, Cost Recovery Strategy and Implementation Plan	Lack of national Water Use Efficiency Policy and technical efficiency solutions	National planning and policy frameworks for improving water use efficiency and cost recovery assessed and required reforms endorsed including selection and installation of appropriate water use efficiency equipment	National report on legal and institutional aspects of policy development, consultation meeting reports	National government prepared to reform
	1.2 Ecological health status of natural water systems are characterised to strengthen and support water resource management	Status of database and number of datasets contained within	Scientific information regarding status of natural water systems in Niue is lacking	National Water Quality and Marine Health database developed and populated with data collected through participatory water and coastal monitoring programme	Endorsed policy, implementation plan and cost recovery strategy	Public prepared to reform and pay for water services
	1.3 Enhanced culture of water resource protection in Niue stimulated through targeted community awareness and training	Percent increase in target population with active understanding of water quality and use	Community understanding of the impacts of poor water quality and misuse is limited	Proportion of target community members with awareness of the impacts of water quality and technical skills to successfully practice water use efficiency increased by 50% through innovative participatory techniques	National Water Quality and Marine Health database available online, monitoring and assessment reports, training workshop documents including attendees, minutes and completion reports	Government staff are available for training in and implementation of monitoring programme
						Consistent use of standardised data collection methods and procedures
						Awareness and capacity building materials are sufficiently well designed to engage community members and resource users

Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
2. Coastal and groundwater protection enhanced via targeted reductions in land-based contaminants	2.1 Reduced environmental stressors on marine and terrestrial ecosystems via piloting of waste collection systems	Volume reduction in illegal waste dumping Status of Waste Management Plans and implementation	High levels of illegal waste dumping contributes to ground and coastal water pollution	Volume of illegal dumping of domestic and commercial solid waste, wastewater and septic sludge reduced by 30% through a developed Transfer Station, appropriate Waste Management Plans and sludge treatment options	Endorsed Transfer Station design and construction plans, endorsed Waste Management Plans and approved sludge treatment system	Design and operation of Transfer Station and sludge treatment systems is effective in reducing volume of illegal waste dumping
	2.2 Environmental and public health safeguarded via targeted reductions in nutrient and pathogen contamination of groundwater and coastal areas	Volume reduction in untreated effluent discharged into receiving environment	(90%) of septic systems at Alofi North and Alofi South are ineffective at reducing contaminant loads	Nutrient and pathogen loads from ineffective septic systems discharging into the receiving environment reduced by 50% through system upgrades at Alofi North and Alofi South	Documents of assessment and monitoring results Comparative studies on nutrient release and reductions of septic systems, documents of assessments and monitoring results	Design and operation of septic systems is effective in reducing untreated effluent entering the environment
					Report on assessment of the operational status [Yr 3]	Sufficient resources available to upgrade required number of systems



Components	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
3. Information management and community awareness increased in support of national Integrated Coastal Management	3.1 Improved access to information and understanding of ICM in target communities	Extent and continuity of community attendance at awareness raising events	Limited community understanding of ICM	Community awareness programme for integrated coastal management implemented at 5 target communities through targeted education and monitoring programme, STAR project exchange and participatory coastal health assessments	Educational films and documentaries, radio/audio talks, project exchange reports, database of coastal health assessments	Sufficiently well-designed education materials to improve community understanding Capacity exists to undertake basic coastal health assessments
	3.2 National uptake of ICM planning and investment strengthened through the development of village level ICM plans	Status of the ICM plans and uptake of recommended management strategies	No existing ICM plans in Niue	Village level ICM plans developed through community management networks at 2 priority sites in Niue	Community consultation meetings, ICM Plans for 2 priority sites, implementation plans and activities	Adequate sources of funding for STAR project exchanges Communities will sufficiently engaged and educated to develop ICM plans
	3.3 National capacity for environmental assessment and water quality analysis increased to identify threats from land-based contaminants to coastal waters	Number and continuity of people trained in data collection techniques Status of data collection programmes for 2 priority sites	Limited existing knowledge and skill base in environmental data collection	Ecological health of coastal waters of Niue characterised and land-based contamination processes established through participatory ecosystem and coastal habitat data collection programme at 2 priority sites	Training workshop reports including number of people and level of training achieved Monitoring results, analysis and research reports, comparative studies and final evaluation report [Yr 3]	Willingness of national level staff to be involved in data collection and training Resources are sufficiently available for reliable analysis and evaluation of coastal process to produce scientific results
						Adequate planning support is available



