Implementing Sustainable Water Resource and Wastewater Management in Pacific Island Countries

GEF PACIFIC IWRM PROJECT RESULTS NOTE

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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.

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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 is as high as 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 subsequnetly 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 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 'bunding' 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 90m^3water 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 Pan 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 beings 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.

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4. RESULTS: WATER RESOURCE AND ENVIRONMENTAL STATUS

The water supply in Niue is groundwater-based and unchlorinated. 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 groundworks 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 325m^3 (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 m^3 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.