



# GEF PACIFIC IWRM PROJECT RESULTS NOTE

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05-11-2013

## Integrated Freshwater and Coastal Management on Rarotonga



### Top 3 Project Results

1. Successful demonstration project to trial and monitoring onsite household sanitation systems, which has contributed to development of a programme to upgrade systems at 1,200 homes.
2. Preparation of an Integrated Water Resources Management Policy, which is an essential component of the strategic framework for future management and protection of water resources.
3. Strengthened engagement with and involvement of communities, leading to significantly increased awareness of the issue of water resources management.

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## 1. PROJECT OBJECTIVE

*The overall objective of project is to reduce stresses on water resources and the quality of freshwater and coastal waters in Rarotonga, through an integrated water resource management framework.*



**Figure 1:** The Demonstration Project area – Muri-Avana

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## 2. RESULTS: PROCESS

*The need to set up a Project Management Unit for the IWRM project was a major contributory factor in the establishment of the WATSAN (Water, Waste and Sanitation) Unit within the Ministry of Infrastructure and Planning (MOIP). In three years, the WATSAN Unit has become a key unit and focal point responsible for planning, policy, management and project delivery across all major programmes and projects related to water resources in the Cook Islands. The programme of work managed by the WATSAN Unit is overseen by a Project Steering Group and a Stakeholder Liaison Group, which - between them - comprise representatives from all of the relevant Government Ministries and agencies, the relevant Development Partners, businesses, communities and NGOs. These forums, and the general programme of work being delivered by the WATSAN Unit have facilitated substantial streamlining of the interactions between the various stakeholders and – particularly at Government Ministry level - have led to significantly increased liaison, close-working, coordination and effectiveness in delivery of initiatives that will have long-term benefits for water resources management, infrastructure development, pollution prevention and environmental stress reduction in the Cook Islands.*

### **2 (a) INDICATOR#1: PROJECT DESIGN AND PM&E PLAN ENDORSED BY PROJECT STEERING COMMITTEE**

The target of the IWRM Project was to have the project and PM&E plan implemented by August 2011 and a subsequent consultation report endorsed by the Steering Committee. The WATSAN Programme Steering Group (PSG) endorsed the original project design and plan for the Cook Islands IWRM Project. Following discussion with SOPAC, elements of the original project design have subsequently been amended to take into account development of related projects and programmes (for example the New Zealand Aid funded Waste Management and Sanitation Improvement (WMI) Programme) and to ensure that all related projects and programmes are aligned and provide for

efficient delivery of outcomes. The amended design and plans have been endorsed by the Project Steering Group.

## **2(b) INDICATOR#2: PROPORTION OF COMMUNITY ENGAGED IN WATER RELATED ISSUES**

Prior to the project, community engagement and awareness-raising activities happened mostly in a reactive manner, responding to issues or requests. The targets for the project were to increase the number of engagement activities and to increase attendance at awareness raising activities.

As part of delivering its programme of work, WATSAN has created the role of Communications Advisor, and has developed communications strategies and plans. In implementing these, WATSAN has held regular meetings with local communities and community groups and has provided periodic, targeted updates on project progress and next steps, at open meetings, which have been very well attended. A diverse range of community stakeholders are represented on the Programme Stakeholder Liaison Group including Muri Environment Care, the Chamber of Commerce, Te Ipukarea Society, Koutu nui (traditional land-owners) and various Government Departments. This group functions successfully with a high-level of discussion and engagement around water-related issues and provides a strong feed-back mechanism.

In addition to community meetings and events, a wide range of other engagement and awareness activities have been undertaken by WATSAN, including regular articles and columns in local media, advertising campaigns around water and lagoon protection issues, sponsorship activities (including high profile sponsorship of the Vaka Eiva international paddling event held in Rarotonga), and information packs for individuals directly involved in WATSAN projects or programmes. All community focused material is produced in both English and Cook Islands Maori.

The WATSAN office is located in Muri – the main area of the unit’s work – and this has proved a successful engagement tool with many locals dropping in to ask questions or discuss water and lagoon issues. WATSAN also now has a website containing information on the IWRM project.



**Figure 2:** WATSAN Unit Manager Tekao Herrmann mans the WATSAN information station at the 2011 Vaka Eiva event. WATSAN’s on-going sponsorship of the event demonstrates the unit’s commitment to the community and allows our team to pass on vital water, waste and environment messages to organisers, competitors and volunteers.

## **2(c) INDICATOR#3: LESSONS LEARNED INCORPORATED INTO OTHER PROJECT(S) AND/OR REGULATIONS**

Target: Replication demonstrated by end of project

The IWRM project has been highly successful in shaping major ongoing projects in the Cook Islands. The trials of various onsite wastewater treatment and disposal options at demonstration sites in the Muri-Avana area were instrumental in securing a wider pilot-scale project under the New Zealand and Australian Aid funded Waste Management and Sanitation Improvement (WMI) Initiative. The pilot involved upgrading sanitation systems at over 200 homes in the Muri-Avana area, ensuring that all domestic sanitation systems in the area meet the relevant Regulations and bringing sanitation up to current international standards for onsite treatment and disposal. That work, accompanied by related water quality and system discharge monitoring facilitated further discussion on the long-term strategy for sanitation in the Cook Islands, and identification of a further 1,000 properties across Rarotonga and Aitutaki that require upgraded onsite sanitation systems. The EU, New Zealand and Australian aid partners have worked with the Government of the Cook Islands to develop and provide funding for a four-year programme of work, with a budget of \$NZ18 million, to upgrade those 1,000 onsite systems and begin assessments and upgrades of sanitation systems in the other outer islands. In many ways, the trigger for this large-scale replication was the installation and monitoring of 10 trial systems under the IWRM project.



**Figure 3:** Hon Murray McCully MP, New Zealand Minister for Foreign Affairs, Hon Teariki Heather MP, Cook Islands Minister for Infrastructure and Planning and Her Excellency Joanna Kempfers, New Zealand High Commissioner to the Cook Islands, together with members of the Muri-Avana Community, following Minister McCully's announcement in August 2013 of a further \$10 million in funding for an ongoing Sanitation Upgrade Programme in the Cook Islands

#### **2(d) INDICATOR#4: NATIONAL STAFF ACROSS INSTITUTIONS WITH IWRM KNOWLEDGE AND EXPERIENCE**

At the outset of the IWRM project, staff with knowledge or water and water resource management issues was present in the National Environment Service, Ministry of Marine Resources, and Ministry of Health and in the Water Division of MOIP. There was a potential gap in the resources in terms of policy, planning and project delivery related to management of water resources. That gap has now been filled with the formation and development of WATSAN, which – by the end of 2013 – will include a Unit Manager, a Programme Co-coordinator, a Technical advisor, a Communications Manager, and a Programme Administrator. All of these staff members are based permanently in the Cook Islands and are working exclusively on projects and programmes related to water resources management.

Between them they have a wide range of skills and educational backgrounds – including civil engineering, environmental science, geology, finance and communications – and many years' experience.



Figure 4: WATSAN staff at a community event in Muri

## **2(e) INDICATOR#5: NATIONAL IWRM COMMUNICATION PLAN FRAMEWORK IMPLEMENTED**

When the Project started the communication plan was to be implemented by July 2012. WATSAN has developed a communications strategy and an annual communications plan across its full programme of work, which incorporates the current IWRM project. The strategy and first annual plan were implemented during the first half of 2012.

The various projects and programmes currently being managed by or in planning stage with WATSAN are focused on delivering improved water resources management across the Cook Islands, and so the aim in developing a single communications strategy and plan was to ensure full integration in communications across that range of projects and programmes. The strategy and plan were reviewed and approved by the Project Steering Group and Stakeholder Liaison Group, and their delivery has been overseen by WATSAN's Communications Manager.



**Figure 5:** A meeting of representatives from the Muri-Avana community to discuss the project

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### **3. RESULTS: STRESS REDUCTION**

*The project has focused on reducing stress caused by pollution of surface waters, principally by addressing the issue of poor quality onsite domestic sanitation and trialing modern, package secondary wastewater treatment and land application systems for individual homes. Supporting this has been a water quality and discharge monitoring programme designed to gather information to assess the effects of the improved sanitation systems. WATSAN has worked closely with Public Health officials in assessing the scale of the problem associated with waste from animal management and has run a high-profile education and awareness campaign on the proper methods and legal requirements related to pig waste management. The project has also looked at the issue of stress on drinking water resources, through assessing the potential for use, and viability of groundwater resources in the Nikao/Arorangi area.*

#### **3(a) INDICATOR#1: NITROGEN POLLUTION DISCHARGED TO GROUNDWATER AND MURI LAGOON**

There are very few commercial-scale 'piggeries' on the Cook Islands. The majority of pigs are kept in small numbers (<6) at individual households. Monitoring nitrogen discharges from such situations, and the potential reduction arising from incentives, education and enforcement measures implemented by the Cook Islands government, would be extremely difficult and impractical in terms of resource requirements. Nonetheless it was a target of the project to reduce nitrogen discharged to the lagoon from piggeries by 90% and reduce in nitrogen loads at a household level from household trials by 35%.

WATSAN is running an extensive education and awareness campaign regarding animal waste management and is working closely with the Ministry of Health on enforcement of relevant Regulations, and it is planned that extensive inspections of individual properties where pigs are kept, will be conducted over the next 1-2 years. In conjunction with this, WATSAN has worked closely with the Ministry of Marine Resources to ensure that effective monitoring of freshwater, groundwater and the lagoons is being conducted, in order to gather data that facilitates understanding of overall changes in water quality resulting from the full suite of relevant initiatives, projects and programmes in place. A revised water quality monitoring programme was initiated under the IWRM project during 2013, and the results from this should begin to provide vital data on nutrient loads – and the effects of reduction and management initiatives – over the next 1-2 years.



**Figure 6:** Small pig pen in the Muri area

### **3(b) INDICATOR#2: REDUCTION IN SEWAGE POLLUTION IN MURI COMMUNITY**

Monitoring of the trial onsite wastewater treatment and disposal systems installed as part of the IWRM project is ongoing and the target of the project was to achieve a 35% reduction in nutrients and organic loads at a household level from household trials. Results to date indicate that reduction in organic loads at individual household level is in excess of 50%, compared with the baseline situation at the start of the project, in which most houses were reliant on old, poorly designed and badly maintained septic tanks. Nutrient reduction across the wastewater treatment and disposal process is largely reliant on the effectiveness of well-designed land application systems. Initial indications from monitoring are that substantial nutrient reduction can be achieved with these systems. Ongoing monitoring of groundwater over the next 6 – 12 months will give a more comprehensive and reliable indication of the degree to which this is being achieved.



**Figure 7:** Package secondary treatment plant and land application system being installed at homes in the Muri-Avana area

**3(c) INDICATOR#3: WASTEWATER DISCHARGE FROM DEMONSTRATION SITES MEETS NATIONAL EFFLUENT STANDARDS**

Monitoring of onsite wastewater treatment and disposal systems installed as part of the IWRM project is ongoing and the target of the project was for discharges to meet Public Health (Sewage) Regulations 2008 or revised regulations. Indications from the monitoring conducted to date is that the sanitation systems installed at the IWRM demonstration sites produce wastewater that complies with the relevant Regulations.



**Figure 8:** Installed system at an IWRM Demonstration Site in Muri

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**4. RESULTS: WATER RESOURCE AND ENVIRONMENTAL STATUS**

*The project aims to gather information on environmental water quality and groundwater resource availability as part of its overall approach to integrated water resource management. This is achieved through: targeted surface water quality monitoring and assessment; monitoring of groundwater quality in and around the Demonstration Project area and; assessment of available groundwater resources in the Nikao/Arorangi area.*

**The project has no detailed status indicators related to the above, but the following is a summary of work conducted during the project:**

**(a): Monitoring of Surface Water Quality**

WATSAN has worked closely with the Ministry for Marine Resources (MMR) during the project to establish and deliver a water quality monitoring programme that provides robust data regarding environmental water quality, the effects of discharges from land on that water quality, and the effects of improvements made in infrastructure and practice during the project. MMR staff, working with

MOIP staff, conducted regular sampling at a variety of locations around Rarotonga, and samples are analysed for critical pollutants and indicators. In addition, a monitoring buoy has been established in Muri Lagoon, monitoring continuously for key indicators of water quality and sending real-time data to a logger in the WATSAN office. WATSAN and MMR commissioned an expert review of the water quality monitoring programme during 2013, which has resulted in improvements being made in sampling locations, frequencies and parameters assessed.

### **(b) Groundwater quality monitoring**

Under the IWRM project, WATSAN contracted a team from Southern Cross University, to conduct monitoring of groundwater in the vicinity of the properties with new sanitation systems installed as part of the Demonstration Project. Preliminary results form that monitoring are expected in late 2013



**Figure 9:** Drilling groundwater monitoring wells in the demonstration project area

### **(c) Groundwater resources assessment**

WATSAN is in the process of contracting external expertise to conduct a groundwater resources assessment in the Nikao/Arorangi area of Rarotonga. The assessment will focus on determining available quantities and quality in an area of Rarotonga that is prone to shortages during extended spells of dry weather. This aspect of the project is – perhaps – less critical than at the outset of IWRM, in view of the fact that the Government of the Cook Islands has entered into Te Mato Vai; the Cook Islands Water Partnership, with the governments of New Zealand and the People’s Republic of China. Te Mato Vai will deliver a complete upgrade of Rarotonga’s water supply network, providing potable water reliably, to the boundaries of all properties served by the current network, by 2015/16. Nevertheless, there remain benefits in assessing the availability of groundwater as a supplemental supply source, and the Nikao/Arorangi investigation will therefore go ahead, commencing in late 2013.

